Working Beyond State Pension Age: The impact of income and work-family life history

Dr Naomi Finch
Draft: Not to be quoted

Introduction

Extending working life, and enabling and encouraging people to work longer, is a key policy for tackling pensioner poverty (Department for Work and Pensions, 2006). Life expectancy, and the number of years people spend in retirement, is increasing. Men aged 65 in the United Kingdom could expect to live a further 16.6 years and women a further 19.4 years if mortality rates remained the same as they were in 2003-05 (Office for National Statistics, 2006). This places greater demand on the social security system, with a larger pot of money required to fund retirement. Working longer provides a direct means by which people can supplement their income in later life, but is also a way of building up greater state and private pension provision for the future. To encourage longer working, the government has increased the female state pension age to 65 (by 2020), and the recent White Paper has proposed that the pension age should be raised to 68 for all by 2044 (DWP, 2006). However, the average age of retirement is currently above state pension age for women (62) and beneath it for men (64) (DWP, 2006). That women are more likely than men to work beyond state pension age indicates that factors other than the state pension age play a role in increasing extending working life.

Most research has focused upon reasons why people, especially men, exit the labour market *before* reaching state pension age. There has been less attention on the factors associated with working *beyond* state pension age, including why women are more likely than men to extend working life. Quantitative and qualitative studies have found that tenure, ethnicity, caring status, health status, partner's working status, regional unemployment levels, and financial position are associated with working after state pension age, regardless of gender (Smeaton and Mckay, 2003; Humphrey *et al*., 2003; Sainsbury *et al*., 2006; Barnes *et al*., 2004; Phillipson and Smith, 2005). The main gender difference is that marital status is salient for women but not men, with divorced and separated women (but not men) particularly likely to extend working life (Smeaton and Mckay, 2003).

Financial factors are likely to be a key reason why women, and especially divorced women, are more likely than men to extend working life. It is well documented that women are more likely than men to have a low pension income (DWP, 2005). This is a reflection of their work-family life history: Women's role as carer within the male breadwinning model of the family leads to broken work histories, part-time work and low pay and limited capacity to build up an independent income throughout life (Bardasi and Jenkins, 2002; DWP, 2005; Ginn and Arber, 1991, Ginn, 2003; Evandrou and Glaser, 2003; Sefton *et al*., forthcoming). This results in dependency upon their husband/partner or the state for pension provision, and increased likelihood of individual poverty in old age. Therefore timing of marriage, divorce, remarriage and childbearing is

important for women's ability to build up pension income (Sefton *et al.*, forthcoming). Smeaton and Mckay (2003) found that women, but not men, were more likely to work after state pension age despite very high family savings (over £20,000). This may indicate that women extend working life to increase their individual pension and compensate for years spent out of the labour market while caring for children, even when their partner's savings are high. Also, the fact that divorced and separated women are more likely to work beyond state pension age may reflect their double disadvantage: broken work history and no partner's income to sustain them in old age (Bardasi and Jenkins, 2002). Gender inequalities in work-family history therefore appear to be important for explaining gender differences in extending working life.

However, there is also evidence that having a low income does not always lead to high propensity to work beyond state pension age (Sainsbury *et al*., 2006; Barnes *et al*., 2004). Those with particularly low savings and lower skills (having left full time education early) are *less* likely to work beyond state pension age. Even controlling for education and health levels, those with the lowest financial resources are the least likely to work (Smeaton and Mckay, 2003). This may be related to entitlement to Income Support and other means tested benefits, with returning to work compromising these entitlements. But it may also be explained by work-life history, with individuals with low savings more likely to have had careers in lower-skilled positions, with fewer labour market opportunities. As a result, they may have less negotiating power in the labour market to enable them to continue working beyond state pension age (Smeaton and Mckay, 2003). Thus, it may be that work life histories interact with income levels to influence extending working life.

There is also evidence that people extend working life for reasons other than limited income. Smeaton and Mckay (2003) found that those working over state pension age had greater job satisfaction than those under state pension age, and were also less likely to want to leave work in the following year. Qualitative studies have suggested that this is related to work history and orientations (Barnes *et al*., 2004; Sainsbury *et al*., 2006). Those with established careers in the professional services, with a fairly high degree of choice and flexibility over what they do, are more likely to extend working life for reasons of job satisfaction, especially those who are self-employed (Barnes *et al*., 2004; Sainsbury *et al*., 2006). Divorcees may also extend working life as a means of developing their social life (Smeaton and Mckay, 2003). These findings give some insight of how work history may influence propensity to extend working life, regardless of retirement income level.

To sum up, it appears that inequalities over the life course, especially those related to the gender division of labour, continue into older age to influence need, capacity and desire to undertake paid work after state pension age. The evidence suggests that income interacts with work-family life history to influence working beyond state pension age. But the picture is complicated. This study builds upon the research reviewed above to understand this relationship quantitatively.

The research examines how income and work-family history interact to influence working beyond state pension age.

The aims of the research are:

- To examine the relationship between individuals' lifetime work and family history and working beyond state pension age.
- To examine how income interacts with work-family life history to influence the likelihood that an individual works beyond state pension age.

The objectives are:

- To estimate the relationship between family history and the likelihood of working beyond state pension age. How do timing and pattern of marriage, divorce, separation, remarriage and childbearing influence working beyond state pension age?
- To explore the relationship between a history of interrupted labour market attachment and working beyond state pension age. Do the reasons for interrupted labour market attachment (ie. caring/unemployment/incapacity benefit) differently affect working beyond state pension age?
- To understand the relationship between occupational continuity, and type of occupation on working beyond state pension age.
- To explore the relationship between income and working beyond state pension age.
- To assess how income interacts with work and family history to influence working beyond state pension age.

Methodology

This study estimates quantitatively how working beyond state pension is related to income and work-family life history. To do this secondary longitudinal data analysis is undertaken using retrospective life history data for the first 14 waves of the British Household Panel Survey.

The data crucial for the study was obtained from the BHPS's retrospective employment, marital and fertility history files. Retrospective labour market data has been collated since leaving full time education, including both employment status (in wave 2) and occupational type (in wave 3). In addition, the survey collates the same information in each successive wave for period sine the last interview. The retrospective data and the Panel data is collated in two separate files deposited in the UKDA which were merged (Halpin, 1997; Halpin, 2000). The merged dataset includes information on individual's self reported employment and occupational status at monthly intervals. From this, work histories were summarised. The family history data is contained in a separate dataset (Pronzato, 2007) from which marital and fertility histories were summarised.

Work and family histories are both defined from the age of 20 up to state retirement age (60 for women and 65 for men). Subsequent changes in marital

status are controlled for but are not included in the family history. To be included in the sample, individuals must have complete work and family histories between the ages of 20 and state pension age. In addition, they must be aged over state pension age at some point during the panel (1991 – 2004). This inevitably has led to a smaller sample of men than women. First, they must have non-missing pre retirement work and family history data from a longer period than women. This was considered appropriate given the longer years required for men than women to be entitled to individual pension rights. But, because men do not live as long, the number appearing in the panel study over state pension age will inevitably be smaller. Respondents were also required to have non-missing information on whether they were in paid work after state pension age. Respondents were also only included if they had non-missing personal income data from at least one of the panel years. The sample was trimmed to exclude observations with very low or very high income data.

Individual can be observed up to 14 times during the panel period. Whilst work and family life history remain the same over the panel, other factors may change after state pension age, such as health status, which may impact upon a decision to work or not. Therefore, so this information is not lost, all observations of the same individual are included in the sample. The data was weighted to allow for multiple observation of the same individual. This yields a total sample of 21682 observations on 2677 individual, 7641 observations of 996 men and 14041 observations of 1681 women.

Defining work

Information from individuals post retirement work history was also collated from the retrospective files. This enabled employment data to be collated for the period of their retirement up until wave 14 of the panel, even if their retirement period began prior to the first year of the panel survey. The alternative method would be to use current employment status to define people who worked after state pension age. This would enable changes in health to be more closely linked to work status. However, it was considered that work and family life history would impact upon working after state pension age at whatever time this occurred. Capturing the entire of pensioners work histories up until the final panel observation (or death/ exit from the panel survey, whichever was first) enabled a more full picture to be obtained. Current employment status information would, however, only be available for the years the older person appeared in the panel.

A summary variable detailing the total number of years in paid work post state pension age up until wave 14 was created. Individuals were grouped as 'extenders' and 'non-extenders'. After exploratory analysis, an extender was defined as working for any period of time at any point after state pension age. Thus, older people were defined as extenders if they undertook paid work for at least a month at any point after state pension age. By this definition, 28.5 percent of our sample were treated as extending working life, 21.5 percent of men and 32.6 percent of women. Detailed information on hours worked was not included in the retrospective files, and therefore pensioners could be working for any

number of hours as long as they defined themselves to be in paid work. Exploratory analysis was undertaken using different definitions, namely extending working life for a full year after state pension age and extending working life for a total of a year (but not necessarily in succession). There were some differences in characteristics between the groups. But analysis demonstrated that there was no large differences in the results when using the different definitions (see Appendix A5). Moreover, the more limited definitions produced smaller cells numbers, which would make analysis of sub groups difficult. Therefore, the broad definition of extender was chosen. 'Non-extenders' include those who have retired at or before state pension age, and will not have undertaken any paid work beyond state pension age up to the current wave.

Income

Whether income is measured according to individual or (equivalised) household income is crucial to examining female income patterns, especially in relation to marital status (Bardasi and Jenkins, 2002; Sefton *et al*., 2008). This is because people have access to household income rather than just personal, and thus is arguable a better reflection of their material living standards. By the household measure, married women would appear better off that using a personal income measure. When the UK pension system was designed, the male breadwinner/ female carer model of the family was prevalent. Whilst men undertook a life time of paid work, women adopted a domestic role as married wife and mother. Thus they were financially dependent upon men. As a result, women were unable to build up an independent pension. To overcome this, it was assumed that women would share their partner's pension and thus they could receive a pension via their husband.

However, household measures assume equal distribution of resources within the household, and that husbands themselves have the ability to build up a large enough pension (Ginn and arber, 2001; Ginn, 2003). Vogler undertook quantitative analysis on financial allocation between couples and showed that wives bear more financial deprivation than husbands, especially where income were low. Reliance upon household income can have important affects when the relationship breaks down, leading to downward income mobility on widowhood or divorce (Zaidi, 2001). Moreover, household income relies on potential, and dependency on another's discretion to allocate income. Thus it is an indirect, rather than direct income. Individual income, on the other hand, is a direct measure of personal wealth, and using this measure demonstrates more openly the difference between men and women's incomes in old age. The inclusion of partners' income will in many cases obscure the financial impact of married women's own family and work histories (Sefton et al, 2008), which in this analysis is important.

Therefore, gross individual income was used for the analysis, although sensitivity analysis was undertaken using household income data. Generally, the results did not change when household income was used but the sample size was reduced, but any important differences have been pointed out in the text. The overall income measure is monthly non-labour income after state pension age.

This comprised of transfer, investment, benefit and pension income. Certain income sources were examined in more detail – namely income form private pension, occupational pension, investments and savings, and income support. As individuals are observed at multiple points in time, up to 14 years apart, incomes are adjusted to May 2010 prices according to the retail price index.

Analysis

Work-family histories were summarised according to different indicators within the broad areas of employment status history, occupational history, marital history and fertility history.

Employment status history:
- Pattern of employment (years in employment; timing of career; mainly part-time/mixed/mainly full-time).
- Interrupted work history (short break; persistent break; recurrent breaks; timing of breaks).
- Reason for breaks (e.g. caring, incapacity, unemployment).

Occupational history:
- Type of occupation (major occupational group, calculated as the occupation in which the individual spent the highest proportion of their working life; ever working in certain occupations).
- Pattern of occupation (continuous occupation; recurrent changes; one or two changes; timing of change: late, mid, early career).

Marital history:
- Whether ever married, and timing of marriage.
- Whether ever divorced or separated and timing of divorce/ separation.
- Whether those divorced re-married.

Fertility history:
- Number of children.
- Pattern and timing of childbearing.

Marital and fertility history:
- Marital timing and the presence of children
- Patterns of divorce/ widowhood and the presence of children

Bivariate analysis is undertaken to understand the extent to which various characteristics, primarily income levels and sources, are significantly associated with working beyond state pension age, and how work and family history is related to income. In order to examine the relationship between work-family life history and employment in later life, it is important to control for other factors that may be correlated with both. The variables controlled for were socio-demographic characteristics (sex, marital status, tenure); health status (limiting disability, any income from disability living allowance, any income from

attendance allowance, health over the last year), access to job opportunities (access to a car, region, educational qualifications), financial resources (total income excluding earnings, any income from private pension, any income from occupational pension, any income from investments or savings, any incomes from income support, future financial expectations). Birth cohort and years since reaching state pension age were also included. These account for the different pension systems and rules, which may influence working beyond state pension age.

Binary logistic regression was used to examine how income and work-family life history influence the likelihood of working beyond state pension age, whilst holding other factors constant. To assess how important work and family history was in predicting the odds of working beyond state pension age, separate regressions were run for each way of categorising work and family histories in order to explore the extent that each one significantly improved the model fit. Each indicator was entered as a separate block to understand how much it improved the model fit, and to understand whether it was still significant even after for controlling for other factors, including income. An overall model was fitted together with separate ones according the gender. Tests for interactions to assess whether work-family life history influences working beyond state pension age differently for different groups. This enables greater understanding of how work-life history interacts with income in influencing working beyond state pension age. How family history interacts with work history was also explored in order to understand how the work history of mother's, father's and divorcees affect working beyond state pension age.

Linear multiple regression was also undertaken to explore the relationship between the dependent variable, number of years (and fraction of years) worked after state pension age, and possible predictor variables such as number of years in paid work prior to state pension age, income level etc. To avoid zero inflated data, this was undertaken with only those who had worked after state pension age to understand the impact of predictor variables in working longer after state pension age. This enabled us to understand the direction and strength of the association of each variable with working after state pension age by interpreting the coefficient. So, it was possible to examine, for example, the extent that post state pension age work duration increases with each pound increase or decrease in income or with each additional year worked prior to state pension age. This enabled further understanding of the impact of work-family history and income upon the duration of working beyond state pension age.

Working after state Pension age

The wide definition of what denotes working beyond state pension age –ie working for at least a month at any point after state pension age up to the last observed panel year – revealed that 28.5 percent, a relatively high proportion, had done some paid work at some point. A third of women had undertaken some paid work compared to just over one in five of men. The longest time worked was 19.33 years for men and 17.58 years for women. But the mean was 0.66of a year for men and 1.08 years for women. Excluding those who did not extend

working life, of those who did, the mean years spent in paid work was 3.07 years for men and 3.30 for women. The median for men was lower at 1.33 years and for women 2.33 years. The mode for both was only 0.92 year spent in paid work. Only 8.3 percent of men had extended for a full year, and 16.6 percent of women.

Of those having undertaken paid work at any point after state pension age, the majority of men had spent their paid work in mixed part time and full time work, whereas the majority of women had undertaken part time work mostly. However, the proportion undertaking mostly full time work was similar for men and women. These patterns are very different from those observed during working life. Men and women saw a reduction in the proportions working mainly full time – men a reduction of 53.7 percentage points and women down 23 percent. However, both groups experienced an increase in the proportion undertaking part time work – up 31.6 percentage points for women and 11.8 percent for men.

Table 1: Proportions of men and women working after state pension age

	Men	**Women**
Extender any	21.5	32.6
Mostly part time	28.8	55.8
Mostly Full time	29.3	31.3
Mixed	41.4	12.9
Extender full year	8.3	16.6
Observations	*7641*	*14041*

Marital status

The differences between female extenders and non-extenders and male extenders and non extenders according to marital status is not statistically significant. Thus those working beyond state pension age are no more likely to be married, widowed, divorced/ separated or never married compared to those not working longer.

Table 2: Differences between female extenders and non extenders by marital status

	Female		
	extenders	non extenders	
Married	50.4	44.9	46.7
Widowed	44.5	48	46.9
Never married	*5.1*	*7.1*	*6.4*
Individuals (n)	*549*	*1133*	*1682*

Table 3: Differences between male extenders and non extenders by marital status

	Male		
	extenders	non extenders	

Married	75.8	71.7	72.6
Widowed/div/sep	18.1	20.2	19.8
Never married	*6*	*8.1*	*7.6*
Individuals (n)	*215*	*782*	*997*

It is also useful to compare between male and female extenders in terms of marital status to understand whether married women were more likely than men to extend working life. Overall, older people who are never married are less likely than those widowed/ divorced or married to extend working life, although this difference is not statistically significant. We find that the differences between married men and women are highly significant, with married females significantly more likely to extend working life than married males (35 percent compared to 22.5 percent). Also, widowed, divorced or separated men are less likely than women who are widowed, divorced or separated to extend working life. The difference between never-married women and men is not, however, statistically significant.

Table 4: Proportions of men and women who are extenders by marital status

	Male	**Female**	**All**
Married / couple	22.5***	35.2***	29.1
Wid/div/sep	*19.8***	*31.0***	*28.7*
Never married	*17.1*	*25.9*	*22.3*
Extender any	21.5	32.6	28.5
Extender any (n individuals)	214	549	*762*

Income

Next, bivariate analysis was undertaken to investigate whether income was statistically related to working beyond state pension age. It can be seen that level of individual income, having an occupational pension, having a private pension and receiving income support were all statistically associated with extending paid work. Financial expectations for the year ahead and investment income were not. However, these two indicators were statistically significantly associated extending work for a *full year* after state pension age (although having a private pension and receiving income support became non significant).

A higher proportion of those with lower individual income were extenders compared to those with higher income (34.4 percent compared to 22.9 percent). However, there was little difference between those with incomes between £1000 and £1500 and those with incomes over £1500.

For males, the differences remained statistically significant, but the pattern is curvilinear. The highest proportion of extenders are amongst those with low incomes, and the proportion falls as income increases, with the lowest proportion of extenders within the second highest income band (£1000-1500).

However, there is an increase in the proportion of extenders when we examine the highest income band. Thus, it may be that those in the highest income extend paid work for reasons other than income.

For females, personal income is not statistically associated with extending working life. This is mainly because the proportions in the middle income bands are very similar, and combing these groups, the association becomes significant. A clear linear association can be observed for females – those with a low income more likely to work beyond state pension age compared to those with a higher personal income. But that personal income is not as closely related to working beyond state pension age for females as it is males may indicate that household income is more influential. Or it may suggest that females extend working life for reasons other than building upon current income.

Examining household income, we can see that it is significantly associated with extending working life for both men and women, although again not as significant for women compared to men. For men, the effects of household income is linear – with a higher proportion of those with lower income extending working life compared to those with lower household income. For women, however, the associations are not so clear. As with individual income, whilst a higher proportion of those with very low income worked beyond state pension age, and those with a very high income had the lowest proportion of extenders, a higher proportion of those in the middle income groups were extenders compared to those in the higher income groups. The association between income and working beyond state pension age is not straight forward.

Examining the importance of income from certain sources, we find that having an occupational or private pension are significantly associated with extending working life, although not for women. However, whilst a *lower* proportion of those with occupational pensions extend working life compared to those without, a *higher* proportion of those with private pensions do. This is likely to be related to the different careers patterns of those with occupational and private pensions.

Not unexpectedly, a significantly lower proportion of those receiving income support were extenders than those receiving. This is likely to be because entitlement to Income Support and other means tested benefits, with returning to work compromising these entitlements, although this association was not statistically significant for men.

It is may be that future financial expectations, rather than current income, impact upon a decision to work. Thus, for example, working longer to build up further pension income for the future may be the result of anticipated future income rather than current. We can see, however, that financial expectations for the year ahead is not significantly associated with working after state pension age.

Table 5: Proportions of male and female extenders according to income.

	Male		Female		All
Individual income					
Under £750	*30.7***	*30.7***	*35.2*	*35.2**	*34.4****
£750-1000	*21.0***	*17.8***	*30.2*	*30.7**	*26.6****
£1000-£1500	*15.3***		*30.9*		*22.8****
Over £1500	*21.4***	*21.4***	*25.6*	*25.6**	*22.9****
Occupational pension					
No	*30.0****		*32.2*		*31.7****
Yes	*17.2****		*35.3*		*24.2****
Private pension					
No	*19.8****		*32.5*		*28.0***
Yes	*35.3****		*43.7*		*38.5***
Investment income					
No	*18.5*		*30.5*		*26.6*
Yes	*23.1*		*34.6*		*30.0*
Income Support					
No	*22.1*		*34.2***		*29.5***
Yes	*14.8*		*23.6***		*21.1***
Financial expectations					
Better					
Same	21.4		34.0		29.0
Worse	21.2		38.0		30.9
	22.1		31.4		28.1
Household income					
Under £750	*39.0****		*41.4**		*40.6****
£750-1000	*29.1****		*33.3**		*31.6****
£1000-£1500	*22.9****		*36.1**		*30.1****
Over £1500	*17.8****		*30.5**		*25.9****
Extender any	21.5		32.6		28.5

Next, we examined how income impacted upon the odds of working beyond state pension age using logistic regression. This enables us to understand the part that income plays in the likelihood of working beyond state pension age, and by holding other factors constant, it is possible to isolate the importance of income. Table 6 shows the odds ratio for individual income an sources upon working beyond state pension age, with and without controls. The first column shows the impact that income has upon working beyond state pension age before other factors have been accounted for, and the second column takes into account other factors. An odds ratio over one indicates that the income increases the odds of working beyond state pension age and a figure below one indicates that it decreases the chances. The odds ratio is relative, and thus indicates the odds of working beyond state pension age relative to the reference group (ref). The indicators of income were entered as a block.

All income indicators, except financial expectations, significantly impact upon the odds of working beyond state pension age before other factors are controlled

for, but not after. The significance of individual non-labour income for working beyond state pension age is clear. Having a higher personal income significantly reduces the odds of working beyond state pension age relative to having very low personal income. After controls are added, only the two highest income bands remain significant. However, it is clear that higher income reduces the odds of working beyond state pension age.

Being in receipt of an occupational pension is closely linked to work history – with those working full time more likely to be in receipt than those working part time. Examining type of income, having some occupational income significantly reduces the odds of extending work without controls, but this becomes non-significant after accounting for other factors.

The proportion in receipt of a private pension is very low (7.9 percent) – with males more likely to be in receipt than females. Having a private pension is also closely related to work history, with those in predominantly mixed work, and self employment, more likely to be in receipt. Having some private pension significantly increases the odds of working beyond state pension age, even after other factors are controlled for. This may indicate then that being self employed and in more mixed employment is a predictor for the number of years worked beyond state pension age.

Receiving income support significantly reduces the odds, even after other factors are controlled for. Having some investment income and savings significantly increases the odds of working beyond state pension age, but not after other factors are controlled for.

Again, we can see that financial expectations for the year ahead does not significantly impact upon the odds of working beyond state pension age, remaining insignificant with other factors controlled for. As can be seen in the tables below, this indicator remains insignificant for gender and marital status, and therefore will not be discussed further.

Table 6: Logistic regression for the odds of working beyond state pension age according to personal income

	Without controls	With controls
Financial expectations for the year ahead		
About the same	*ref*	*ref*
Better than now	1.017	0.843
Worse than now	1.047	0.839
Non labour income		
Under £750	*ref*	*ref*
£750 to £1000	0.716**	0.792
£1000 to £1500	0.586***	0.670*
£1500+	0.557***	0.585**
Occupational pension income		
None	*ref*	*ref*
Some	0.792*	0.813
Private pension income		
None	*ref*	*ref*
Some	1.651**	1.696**
Investment /saving income		
None	*ref*	*ref*
Some	1.251**	1.144
Income support income		
None	*ref*	*ref*
Some	0.643*	0.672*
Log likelihood:	*2885.762*	*2323.353*
Nagelkerke R Square:	*0.036*	*0.088*

Income and Sex

We also ran separate logistic regression models for men and women (table 7) to understand whether personal income impacts differently according to gender. Individual non-labour income has significant affects for working beyond state pension age for both men and women, and becomes only slightly less significant after controls are accounted for. However, for men, those with individual incomes of £1000-£1500 are significantly less likely to work beyond state pension age than those with low incomes under £750, but those with high incomes after £1500 are not. For women, it takes having a very high income to significantly reduce the odds of working beyond state pension age relative to those with very low incomes.

Occupational pension is important for men but not for women, significantly reducing the odds of extending working life to less than half of those without an occupational pension. Again, this may reflect men's, predominantly full time, work histories reducing the need to build up further income in retirement. All other types of income are insignificant after controls are added.

Table 7: Logistic regressions for the odds of men and women working beyond state pension age according to personal income

	Men		Women	
	Before controls	**After controls**	**Before controls**	**After controls**
Financial expectations for the year ahead				
About the same	*ref*	*ref*	*ref*	*ref*
Better than now	0.993	0.831	0.843	0.829
Worse than now	1.065	0.928	0.839	0.792
Non labour income				
Under £750	*ref*	*ref*	*ref*	*ref*
£750 to £1000	0.656	0.658	0.787	0.825
£1000 to £1500	0.460**	0.487*	0.799	0.854
£1500+	0.690	0.600	0.549**	0.537*
Occupational pension income				
None	*ref*	*ref*	*ref*	*ref*
Some	0.531**	0.456**	1.189	1.099
Private pension income				
None	*ref*	*ref*	*ref*	*ref*
Some	1.752*	1.473	1.588	1.498
Investment /saving income				
None	*ref*	*ref*	*ref*	*ref*
Some	1.382	1.164	1.168	1.137
Income support income				
None	*ref*	*ref*	*ref*	*ref*
Some	0.489	0.629	0.665*	0.678
Log likelihood:	*2885.762*	*2885.762*	*2323.353*	*2323.353*
Nagelkerke R Square:	*0.036*	*0.036*	*0.088*	*0.088*

Income and marital status

Separate regressions were also run for according to marital status – for married, widowed/ divorced and unmarried older people. The odds ratios after controlling for other factors will be reported here, although the ratios before controls are added can be found in the Appendix.

Surprisingly, level, not sources, of income is not significant for divorced/ widowed or unmarried older people in a decision to work beyond state pension age. This suggests that they extend working life for reasons other than income – perhaps work history, or social factors. However, personal non-labour income does have an important impact upon working beyond state pension age for older married people by significantly reducing the odds of working beyond state pension age for those with higher incomes compared to those with personal income under £750 in the month before interview. At the same time having some income from private pension increases the odds of married people working beyond state pension age by 68.7 percent compared to those without any. Personal income is, however, not significant for married women in a decision about whether to extend working life or not. But, for this group, household income is important – married with household incomes over £1500 reducing the odds of extending working life by 54.2 percent compared to those with incomes under £750, even after other factors are accounted for. This may reflect married

women's reliance upon their partner's incomes and pension sharing due to their own limited personal work histories as a result of their assumed caring role within the male breadwinner model of the family. Household income, however, is more important for married men - with high household incomes (relative to low) reducing the odds of extending work by 71.8 percent. It is likely for both married men and women, that partner's income is also considered in a decision about whether to work longer. For example, a man with a higher personal income might decide to work longer if his partner's personal (and thus overall household) income is low.

Table 8: Logistic regressions for the odds of married, widowed/divorced and never married working beyond state pension age according to personal income (with controls)

	Married	**Widowed/ Divorced**	**Never married**
Financial expectations for the year ahead			
About the same	*ref*	*ref*	*ref*
Better than now	0.815	0.786	0.619
Worse than now	0.806	0.849	0.676
Non labour income			
Under £750	*ref*	*ref*	*ref*
£750 to £1000	0.684	0.854	1.182
£1000 to £1500	0.421**	0.966	0.946
£1500+	0.459**	0.782	1.108
Occupational pension income			
None	*ref*	*ref*	*ref*
Some	0.728	1.088	0.673
Private pension income			
None	*ref*	*ref*	*ref*
Some	1.687*	1.367	3.357
Investment /saving income			
None	*ref*	*ref*	*ref*
Some	1.002	1.357	1.204
Income support income			
None	*ref*	*ref*	*ref*
Some	0.554	0.732	0.600
Log likelihood:	*1253.413*	*884.091*	*126.607*
Nagelkerke R Square:	*0.121*	*0.059*	*0.228*

Income and number of years worked after state pension age

We next examine how income influences working longer after state pension age. In other words, how income impacts upon the length of time worked. For this analysis we are interested in extenders and how long they work. Therefore, non-extenders are excluded from the analysis. Linear multiple regression analysis was undertaken to examine the predictors on the number of years worked beyond state pension age. Only significant predictors have been presented.

Financial expectations for the year ahead is important for predicting whether extenders will work longer, or not. Expecting financial expectations will be better than now has a negative effect – reducing the number of estimated years worked

by 1.036 compared to those expecting their finances will remain the same, with the effect becoming slightly stronger after controls are added.

Interestingly, however, every additional £1000 of personal non labour income a month increases the number of years worked by 0.463, or every £100 increase in income increases the number of years worked by 0.046. Thus, rather than financial necessity being a predictor for working longer, higher incomes are. This is no longer significant after other factors are controlled for.

Also, claiming income support increases the number of years worked by 1.35 years, which is unexpected. It may be acting as a proxy for another indicator of working longer and is not significant after this is controlled for.

Having an occupational pension reduces the number of years worked by 0.965 compared to those without an occupational pension, even after other factors are controlled for. Since, as mentioned above, occupational pensions are closely linked to a full time work history, indicating then that full time work history is an important predictor for the number of years worked beyond state pension age. Having a private pension is also closely related to work pattern but, whilst being in receipt of one reduces the number of years worked, this is not significant after controls.

Table 9: Regressions for number of years working beyond state pension age by personal income

	Without controls	With controls
Financial expectations for the year ahead		
About the same	*ref*	*ref*
Better than now	-1.036*	-1.193*
Worse than now	-0.105	-0.126
Non labour personal income	0.463*	0.293
Occupational pension income		
None	*ref*	*ref*
Some	-0.965**	-0.951**
Private pension income		
None	*ref*	*ref*
Some	-0.946*	-0.683
Investment /saving income		
None	*ref*	*ref*
Some	0.328	0.239
Income support income		
None	*ref*	*ref*
Some	1.350**	0.989
Constant	*3.261****	*5.222****
R Squared:	*0.035*	*0.033*

Dependent variable: number of years worked beyond state pension age (excluding those who did not work). Cohort and number of years since reaching pension age have not been controlled for. This is because the number of years worked will be limited by the number of years since reaching state pension age, and younger cohorts will also have limited years to undertake paid work.

Work history and working beyond state pension age

In this section, we look work and occupational histories, and how they impact upon working beyond state pension age. We examine duration and nature of economic activity and inactivity and the associations with working beyond state pension age for all older people, according to sex and marital status. Thus we want to understand whether people with longer employment or shorter spells of inactivity are more or less likely to work beyond state pension age. Does part time work increase the likelihood for working beyond state pension age, and how do certain types of inactivity such as family care impact more upon working beyond state pension age.

Older men and women's work histories patterns were very different. The average number of years worked was 40.39 year for men, of a possible 45 but only 21.04 years for women – only just over half the possible 40 years. No men in our sample worked part time for more than 61 percent of their working life. On average, men worked part time for only 0.007 percent of their working life compared a female average of 31.3 percent. On average, men worked full time for 81.99 percent of their working lives compared to 62.77 percent for women. In terms of inactivity, 37 percent of men in our sample had never been inactive compared to only 7.6 percent of women. Moreover, 23 percent of women had been inactive for 30 years or more compared to only 1 percent of men.

First, we examine the impact of the number of years in employment upon the odds of working beyond state pension age. The number of years appears to be important for working beyond state pension age, but not in the way anticipated. It might be assumed that the working longer builds up greater income after state pension age, leading to lower propensity to extend work. However, we find the opposite effect. Before controls, being employed for longer significantly increases the odds of extending work compared to being employed for less than five. But the effect is curvilinear, with the odds increasing up to 30 years and falling there after. Thus, working 25 to 30 years is most important for increasing the odds of extending working life.

After controlling for income and other factors, duration of employment remains highly significant and the effect becomes stronger and linear – the more years worked, the higher the odds of working beyond state pension age. Indeed, those working 35 years or more were 26.323 times more likely than those working under 5 years to work beyond state pension age. Thus, working longer *increases* the likelihood of working beyond state pension age.

However, the assumption that longer periods of employment per se builds up greater income is not born out by the evidence, with Sefton et al (2008) finding that working long periods did not impact upon income after state pension age. It was *full time* employment that mattered. We next examined whether type of contract impacted upon working beyond state pension age. The effect of ever being in employed full time, employed part time and self employed and the proportion of working life spent in full time and part time employment were examined.

Working full time did not significantly impact upon working beyond state pension age compared to those not working. However, those working part time were significantly more likely to extend working life - after controls, they were 3.885 times more likely to than those never having worked part time. Thus being in part time work is itself important for working beyond state pension age, regardless of income levels. Likewise, those ever working in self employment were 2.882 times more likely to extend working life compared to those never working as self employed.

We next examined the duration of working full and part time, measured by the proportion of time spent in these type of work as a proportion of maximum possible years. Working full time for up to ¾ of older people's working life increases the odds of extending working life compared to never working full time. Working full time for over three quarter but not quite all of working life has no significant impact upon extending working life, whilst working full time for all ones working life significantly reduces the odds. Whilst it follows that those working longer in full time work will have increased post pension age incomes, potentially reducing the likelihood of working longer, this pattern remains even after taking into account income and other factors.

Those working part time had higher odds of extending paid work compared to those never working part time, regardless of the proportions of time spent in this type of employment. This is perhaps hardly surprising given that part time jobs are generally lower paid, with people less able to accrue pension rights, especially as they are less likely to be covered by private or occupational pension schemes. However, the increased odds of extending work remains even after controlling for income (and other factors), with the odds of extending paid work even increasing slightly.

Duration and timing

What are the odds of extending working life taking into account duration and type of employment? If income was the predominant factor in extending working life, it might be expected that those with shorter careers were more likely to extend working life, with the odds highest for those working part time in shorter careers. As can be seen, even for those in long careers, working mostly full time the odds of working beyond state pension age are significantly higher than those active for less than 15 years. Indeed, taking other factors, including income, into account, increases the odds of working longer. Those with longer careers have higher odds than those with short, with older people with long careers in mixed full and part time work having the highest odds of extending working life – being 13.005 times more likely than those active for less than 15 years. Those with mostly full time careers had the lowest odds of working beyond state pension age, although those with longer full time careers had greater odds than those with short full time careers.

Table 10: Logistic regression of the odds of working beyond state pension age by type and duration of employment

	Without controls	With controls
Number of years in employment		
Employed less than 5 years	*Ref*	*ref*
Employed 5-10 years	2.608*	2.629*
Employed 10-15 years	5.272***	6.017***
Employed 15-20 years	9.106***	11.161***
Employed 20 to 25 years	9.921***	13.793***
Employed 25 to 30 years	11.475***	15.416***
Employed 30 to 35 years	9.646***	16.182***
Employed 35+ years	7.416***	26.323***
Log likelihood:	*3033.122*	*2126.710*
Nagelkerke R Square:	*0.081*	*0.207*
Never full time employed	*Ref*	*Ref*
Ever employed full time	*1.141*	*1.133*
Never part time employed	*ref*	*ref*
Ever employed part time	*3.928****	*3.885****
Never self employed	*ref*	*ref*
Ever self employed	2.852***	2.882***
Log likelihood:	*2913.929*	*2157.447*
Nagelkerke R Square:	*0.144*	*0.193*
Full time employment pattern		
Never employed full time	*Ref*	*ref*
Employed ft 0-25%	2.639***	2.517***
Employed ft 25-0.50%	2.164***	1.967**
Employed ft 0.50-0.75%	2.433***	2.331***
Employed ft 0.75 to 0.99%	0.991	1.149
Employed ft all working life	0.586**	0.567**
Log likelihood:	*3022.050*	*2194.975*
Nagelkerke R Square:	*0.091*	*0.152*
Full time employment pattern		
Never employed full time	*Ref*	*ref*
Employed pt 0-25%	3.135***	3.380***
Employed pt 25-0.50%	3.871***	4.197***
Employed pt 0.50-0.75%	3.812***	4.176***
Employed pt 0.75 to 0.99%	4.011***	4.627***
Employed pt all working life	3.800***	4.413***
Log likelihood:	*2980.935*	*2171.805*
Nagelkerke R Square:	*0.112*	*0.167*
Type of contract		
Mainly full time	*ref*	*ref*
Mainly part time	3.144***	2.706***
Mixed	2.820***	2.640***
Log likelihood:	*2939.255*	*2164.936*
Nagelkerke R Square:	*0.080*	*0.144*

Duration and timing according to sex

Examining duration and type of employment by sex reveals some stark differences. The odds of working longer according to duration of employment is shown in table 5. Men are able to work a maximum of For men, before controls are added, being employed for nearly all of working life significantly increases the chances of extending work five fold compare to working fewer than 15 year. But being in employment for fewer than 40 years reduces the chances of men working beyond state pension age, but this is not statistically significant. However, number of years in employment is not significant after socio-economic factors are accounted for. For women, working longer has the opposite affect – with significantly increased odds of extending working life according to the number of years worked compared to working less than 25 years, even taking into account incomes aswell as other socio-economic factors.

Type of employment also has different affects for men an women. Ever working full time *reduces* the odds of men working beyond state pension age but increases the odds for women. Taking into account other factors, the effects oare slightly reduced but the odds ratios remain significant, although only just for women. But, after controlling for other factors, the likelihood of men ever having worked full time working longer is 73.4 per cent less than their counterparts who have never worked full time but for women the odds are increased by 63 per cent, controlling for other factors.

For both men and women, ever working part time and ever being self employed significantly increases the odds of extending working life. The affects of working part time are slightly larger after controlling for other factors: men ever working part time are 4.802 times more likely to working beyond state pension age compared to never working part time and women are 3.697 times more likely. The effects of being self employed are slightly reduced after taking after factors into account but remain highly significant with both men and women 2.5 times more likely to extend paid work having been self employed during their working life compared to never.

Duration of working full or part time may also make a difference to a decision to working longer. For men, the odds of working beyond state pension age are lower for men working full time all their working life than they are for those only working full time for under 25 percent, relative to never working full time. Thus the longer men spend working full time, the less likely they are to extend working life, although the pattern is not completely linear. For women, however, the odds of extending working life are highest for those working part time for less than 25 percent of the potential maximum and lowest for those working full time for over ¾ but not fully. The odds for those working full time all their working lives are reduced but not significantly. Thus, it appears that those women not working full time for the full 40 years will attempt to make up for it by extending working life. However, this is regardless of income level. Therefore, it may be that they are doing so to build up further pension entitlement.

Duration of working part time shows that men working for less than a quarter of their working life in part time employment for 4.100 times more likely than

those never working part time to extend working life. Working longer than 25 to 50 percent in part time work significantly increased the odds of working beyond state pension age by 13.3 fold but this was no longer significant after account for other factors. Women were more likely to extend working life compared to never working part time regardless of the proportion of working life employed. Those working for less than a quarter of their working lives increased the odds by 2.917 compared to 3.841 for those working part time all their working life's.

Mainly working part time or mixed employment compared to mainly working full time significant increased the liklihood of working beyond state pension age for both men and women, even after accounting for other factors.

Table 11: Logistic regression of the odds beyond state pension age (any) by type and duration of employment for men and women

	Men		**Women**	
	Before controls	**After controls**	**Before controls**	**After controls**
Number of years in employment				
Less than 25 years	*ref*	*ref*	*ref*	*ref*
25-30 years	0.485	0.427	2.741***	2.605***
30-35 years	0.148	0.120	2.991***	3.049***
35-40 years	0.495	0.246	3.315***	3.691***
40-45 years	5.151*	3.203	-	-
Log likelihood:	*911.011*	*642.063*	*2013.107*	*1488.402*
Nagelkerke R Square:	*0.182*	*0.291*	*0.088*	*0.137*
Never full time	*Ref*	*ref*	*Ref*	*ref*
Ever full time	*0.243****	*0.276***	*1.809***	*1.632**
Never part time	*Ref*	*ref*	*ref*	*Ref*
Ever part time	*4.634****	*4.802****	*3.367****	*3.697****
Never self emp	*Ref*	*ref*	*ref*	*Ref*
Ever self emp	2.898***	2.518***	2.308***	2.506***
Log likelihood:	*924.366*	*666.996*	*1958.408*	*1447.277*
Nagelkerke R Square:	*0.178*	*0.250*	*0.130*	*0.177*
Full time employment pattern				
Never full time	*Ref*	ref	*ref*	*ref*
0-25%	0.302*	0.294*	4.145***	4.148***
25-0.50%	0.304**	0.297*	3.417***	3.112***
0.50-0.75%	0.306**	0.346	4.189***	3.709***
0.75 to 0.99%	0.147***	0.190**	2.239***	2.053**
All working life	0.083***	0.124***	1.009	0.796
Log likelihood:		698.996		*1460.183*
Nagelkerke R Square:		0.195		*0.164*
Part time employment pattern				
Never part time	*Ref*	*Ref*	*ref*	*ref*
0-25%	4.004***	4.100***	2.891***	2.917***
25-0.50%	13.304*	16.153	3.821***	3.935***
0.50-0.75%	8.466	26.327	3.810***	3.790***
0.75 to 0.99%	-	-	4.056***	4.585***
All working life	-	-	3.843***	3.841***
Log likelihood:				

Nagelkerke R Square:				
Type of contract				
Mainly full time	*Ref*	*ref*	*ref*	*ref*
Mainly part time	-	-	2.467***	2.831***
Mixed	3.255***	2.232**	2.373***	2.684***
Log likelihood:	*992.701*	*711.122*	*1962.708*	*1427.161*
Nagelkerke R Square:	*0.061*	*0.170*	*0.059*	*0.115*

Pattern of employment

The impact of employment type may interact with length of career to influence extending working life. All varieties of career pattern were highly significant before and after controls were added – increasing the odds of extending work compared to being active for less than 15 years. For all patterns, accounting for other factors served to increase the odds of working beyond state pension age. Long mixed careers and long full time careers were especially affected once taking into account other factors, increasing the odds ratios by large amounts. However, the odds ratios were at very different levels according to different mixes of career. Those with short career had lower odds than those with long, with short full times careers increasing the odds of extending working life by the least - 3.763 relative to being active for less than 15 years. Full time employment also seems to dampen the effects of a long career somewhat, with those in mixed and mostly part time long careers being more than twice as likely as those with mostly full time long careers to extending working life, relative to those active for less than 15 years.

Table 12: Logistic regressions for men and women for the odds of working beyond state pension age by pattern of employment

	Before controls	**After controls**
Active for less than 15 years	*ref*	*ref*
Short career, mostly part time	7.297***	7.793***
Long career, mostly part time	10.611***	10.929***
Short career, mixed	5.804***	6.474***
Long career, mixed	7.047***	13.005***
Short career, mostly full time	2.824**	3.763***
Long career, mostly full time	2.415***	5.503***
Log likelihood:	*2957.004*	*2134.248*
Nagelkerke R Square:	*0.124*	*0.207*

Duration and timing of career

We have seen how length and type of employment is important for working beyond state pension age, even accounting for income and other factors. Examining timing of career confirms this. Sefton et al (2008) noted that (for older women) working into their 50s, regardless of whether their career had been interrupted, mattered the most for income in old age. If income is a motivator for working beyond state pension age, it would be expected that working late in ones career would reduce the odds of extending working life.

What we observe is that working late also has the greatest impact in terms of extending working life. Working for most of ones 50s significantly increased the odds of working beyond state pension age, and controlling for various socio-economic factors, including income, increased the impact. And shorter later careers were the most Controlling for other factors, those with short late careers were 38.753 times more likely than those inactive for more than 15 years to extend working life. *Not* working for most of ones 50s, even with long periods of employment early on in their career did not significantly impact upon working beyond state pension age. Thus, timing of working is important for extending working life. Those working immediately prior to state pension age may be better able to negotiate working beyond – by continuing in their current position or using their recent experience to find other employment.
Table: Logistic regressions for men and women for the odds of working beyond state pension age by timing of employment

Table 13: Logistic regressions for the odds of working beyond state pension age by duration and timing of employment

	Without controls	**With controls**
Duration and timing of employment		
Mostly inactive throughout	*Ref*	*ref*
Active throughout	6.892***	16.995***
Mostly active, retires early	0.606	1.155
Mostly active with mid career break	15.937***	19.804***
Mostly active with early career break	8.203***	15.758***
Extended early	1.362	1.906
Extended interrupted	13.363***	15.230***
Extended late	18.185***	21.382***
Short early	1.477	1.401
Short mid	1.514	1.650
Short late	31.572***	38.753***
Log likelihood:	*27983.825*	*1959.539*
Nagelkerke R Square:	*0.201*	*0.293*

Duration and timing of career according to sex

Due to the different working patterns of men and women, it is difficult to compare duration and timing of employment in such detail. Instead, to understand the importance of timing of employment upon working late we shall explore the likelihood of extending work if men and women have been employed early in their lives and if they had been employed late. For men, being employed early had no significant impacts upon working beyond age 65. Women were 1.256 times more likely than those not employed in their 20s to extend working life but this was no longer significant after controls were added. However, both men and women were more likely to extend working life if they had been employment for at least five years after 50. The odds of extending working life were larger for women than men. Also the controls served to dampen the affects for men but for women taking into account other factors increased the impact of working late upon extending working life. Women were 15 times more likely to

extend working life if they were employed late in working life than not employed late.

Table 14: Logistic regressions for men and women for the odds of working beyond state pension age by timing of employment

	Men		Women	
	Before controls	**After controls**	**Before controls**	**After controls**
Timing of employment				
Not employed early	*ref*	*ref*	*ref*	*ref*
Employed early	1.221	1.236	1.265*	1.231
Log likelihood:	*1035.054*	*710.562*	*2118.053*	*1548.277*
Nagelkerke R Square:	*0.001*	*0.149*	*0.004*	*0.060*
Not employed late	*ref*	*ref*	*ref*	*ref*
Employed for late in working life	8.371***	6.364**	13.203***	15.010***
Log likelihood:	*1003.398*	*696.012*	*1708.234*	*1248.959*
Nagelkerke R Square:	*0.050*	*0.175*	*0.305*	*0.341*

Inactivity

Thus far, it has been indicated that inactivity does *not* increase the odds of extending working life. This is contrary to expectation according to the theory that people extend paid work beyond state pension age to boost their current income or to build up income for the future.

We need to examine this in more detail to understand whether duration and type of inactivity are important. Table 5 shows that longer durations of inactivity decrease the odds of working beyond state pension age compared to experiencing inactivity of less than 6 months. Including the control variables serves to reduce the ratios, and thus increase the effect. There is a linear effect – the longer the inactivity the lower the odds of extending working life relative to those with inactivity for less than 6 months. Thus the odds of working beyond state pension age are reduced by 77.8 percent for those inactive for 6 months to 5 years and by 97.9 percent for those inactive for more than 30 years.

But do all types of inactivity reduce the likelihood of extending working life? We examined the impact of retiring early, of unemployment and sickness, and of family care aswell as 'other' inactivity.

Retiring early, compared to not, was statistically significant, with a large negative effect upon a decision to extend working life. Taking into account income and other controls had little impact upon the odds ratios. The number of years retiring early had some effect – with those retiring more than 5 years early having the lowest odds of extending working life. But the odds of extending working life were reduced by more than 95 percent, regardless of how early the older person retired. Taking this with the finding above that working after the

age of 50 has large positive effects for extending working life reiterates the importance of labour market attachment late in life in a decision to extending working life beyond state pension age.

Being unemployed or sick for more than two years compared to never being unemployed or sick significantly reduces the odds of extending working life by 82.2 percent after other variables have been accounted for. Introducing the controls marginally dampens the affect. However duration is important as being unemployed or sick for under two years has no significant impact upon a decision to work beyond state pension age.

Undertaking family care has highly significant affects upon a decision to work beyond state pension age before controls are in place, although the picture is not straight forward. Those older people who had undertaken family care for less than 20 years were more likely to extend working life, with those undertaking family care for the shortest period of time – less than five years – having the highest odds of extending working, being 2.736 times more likely to extend working life than those never undertaking family care. However, those having undertaken family care long term for more than 20 years were less likely to work beyond state pension age – being 68.1 percent less likely to extending working life than those older people who had never undertaken family care. After income and other factors are accounted for, odds ratios for those undertaking family care for between 5-10 and 10-20 years are no longer significant, and those for under 5 years remain only just significant. This indicates for those undertaking family care for under 20 years, income is important in a decision to extend working life, thus negating any affects once this is accounted for. This is a reflection that those undertaking family care need to extend working life to make up for those periods of time spent out of the labour market with reduced income and pension contributions as a result. However, the odds ratios for those undertaking family care for more than 20 years remained highly significant, with the affects also increasingly slightly – with those undertaking family care for more than 20 years being 77 percent less likely to extend working life than those never undertaking family care. This again appears to reflect the importance of labour market attachment for extending working life – with very lengthy spells out of the labour market being detrimental on the ability to work beyond state pension age, despite the obvious implications for income in old age.

Table 11 Logistic regression of working beyond state pension age by type and duration of inactivity

	Without controls	With controls
Number of years inactive		
Inactive for less than 6 months	*ref*	*ref*
Inactive for 6 months to 5 years	0.312***	0.222***
Inactive 5 years to 10 years	0.437***	0.193***
Inactive 10-20 years	0.557***	0.185***
Inactive 20-30 years	0.389***	0.107***
Inactive 30+ years	0.084***	0.021***
Log likelihood:	*2983.839*	*2052.312*
Nagelkerke R Square:	*0.110*	*0.255*
Type of Inactivity		
Did not retire early	*ref*	*ref*
Retired Early <2 years	0.063 ***	0.052***
Retired Early 2-5 years	0.046***	0.046***
Retired Early 5 years or more	0.023***	0.022***
Was not unemployed/ sick	*ref*	*ref*
Unemployed or disabled <2 years	1.152	1.344
2+ years	0.128***	0.178***
No family care	*ref*	*ref*
<5 years	2.736***	2.087*
5-10 years	2.079***	1.589
10-20 years	1.942***	1.373
20+ years	0.319***	0.235***
Never other inactive	*ref*	*ref*
< 2 years	1.269	1.069
2+ years	2.168*	1.427
Log likelihood:	*2250.141*	*1673.247*
Nagelkerke R Square:	*0.428*	*0.454*

Inactivity according to sex

Periods of inactivity appear to be more important men for explaining a decision to extend working life after state pension age, unless they are very lengthy. For women, being inactive for less than 2 years had no statistically significant affect upon working beyond state pension age, and being inactive for between 2 and 15 years is just significant after controls are accounted for. But women inactive for more than 15 years are significantly less likely to extend working life relative to those inactive for less than 6 months. This remains highly significant after controls are taken into account, with a relative reduction by 83.1 percent in the odds of extending working life, and actually the effect becomes slightly stronger.

For men, inactivity for any length of time reduces the odds of working beyond state pension age compared to men were inactive for less than 6 months of their working lives, even after controls are accounted for. Taking into account other factors, however, serves to slightly dampen the affects of being inactive for 15 years or more – with the association becoming slightly less significant and the odds ratio slightly increasing (from 0.086 to 0.136). This indicates that income

may play a role in long term inactive mens' decision to work after state pension age, but is not important enough to negate the difficulties that this group faces in negotiating employment.

Retiring early, whether it be less than 2 years or more than 2 years, is important in reducing the chances of extending working life for men and women, even when controls are accounted for. Also, being unemployed or sick for more than 2 years compared to not being unemployed or sick, reduces the chances of working after state pension age for both men and women, even after controls, although the reduction affects slightly more for men than women.

Very few men had undertaken family care and thus it was not possible to explore the differences between men and women in terms of the impact this kind of inactivity has upon working beyond state pension age. Thus the pattern reflects that observed for the whole population. One interesting effect to note, however, is that if the household income variables, rather than personal income was included in the model, the increasing effects of being in family care for less than five years are no longer significant. This suggests that household income has more impact upon a decision to work beyond state pension age for women who had taken under 5 years of family care.

Table 12 Logistic regression of working beyond state pension age by type and duration of inactivity

	Men		**Women**	
	Before controls	**After controls**	**Before controls**	**After controls**
Number of years inactive				
Inactive for less than 6 months	*ref*	*ref*	*ref*	*ref*
Inactive for 6 months to 2 years	0.206***	0.200***	0.709	0.520
Inactive 2 years to 15 years	0.059***	0.057***	0.738	0.564*
Inactive 15 or more years	0.086***	0.136**	0.224***	0.169***
Log likelihood:	*813.042*	*578.430*	*1986.837*	*1466.028*
Nagelkerke R Square:	*0.310*	*0.391*	*0.109*	*0.159*
Type of Inactivity				
Did not retire early	*ref*	*ref*	*ref*	*ref*
Retired Early <2 years	0.095***	0.081***	0.048***	0.037***
Retired Early >2 years	0.050***	0.048***	0.024***	0.022***
Was not unemployed/ sick	*Ref*	*ref*	*ref*	*Ref*
Unemployed or disabled <2 years	0.899	1.146	1.516	1.730
2+ years	0.109***	0.129***	0.145***	0.241***
No family care	-	-	*ref*	*Ref*
<5 years	-	-	2.254**	2.104* ns
5-10 years	-	-	1.701*	1.595
10-20 years	-	-	1.571*	1.336

20+ years	-	-	0.253***	0.230***
Never other inactive	*ref*	*Ref*	*ref*	*ref*
< 2 years	1.476	1.238	1.082	0.700
2+ years	0.383	0.547	3.098*	2.661
Log likelihood:	*544.940*		*1476.060*	*1093.338*
Nagelkerke R Square:	*0.440*		*0.445*	*0.470*

Examining occupation is important for several reasons. Certain types of occupation are more likely to attract lower earnings, and less likely to provide occupational pensions – especially manufacturing, distribution and construction sectors (Walker et al ,2000), impacting upon the accrual of pension rights and accumulation of assets than can provide an income in old age. It may also impact more directly upon a decision to work beyond state pension age with those in more manual occupations less able to continue working, and those in more managerial positions perhaps having greater opportunity. Occupational stability also impacts – with Bardasi and Jenkins ( ) finding that people with the same occupational group for 30 years were more likely o be in receipt of, and receiving higher amounts from, an occupational or personal pension, especially for women. We therefore also explore the impact of occupational continuity and change by examining how the number of occupations older people have had during their working lives impacts upon working after state pension age.

A change in occupation increases the odds of working beyond state pension age, than occupational stability throughout ones employed life. The more occupational changes, the greater the chances of working beyond state pension age – with those with recurrent (three or more changes in occupation) 2.079 times more likely than those with no changes to work after state pension age. The effects remain statistically significant after accounting for other socio-economic variables, including income, and the odds are even increased slightly. But, as Bardasi and Jenkins (2002) found, occupational stability mattered less for men than for women, no longer significant after controlling for other variables. For women, they remained significant.

The impact of type of occupation was measured in two ways. First we looked at whether people had ever worked in each occupational type. Ever being a manager, professional, associate professional, in personal protective occupations, clerical and sales increased the chance of working after state pension age. After controls were included professional groups were no longer more likely to work longer than those never in this profession. However, the other occupational grouping remained statistically significant, with the odds increasingly slightly in all but sales and clerical occupations. However, it must be born in mind that those in the reference group also included those never employed, which may have a bearing on the results. The second way we examined occupational effect accounted for this. It examined occupational effect according to which occupation had been the main one – ie. for more than half their employed lives. Those with no dominant occupation were the reference group. Those with missing occupational data and being employed for less than 25 percent of their working lives were treated as separate groups. Occupational

type, measured this way, becomes much less important on a decision to work after state pension age, especially after other variables are accounted for. So, before controlling for other variables, those in mainly craft or plant operative occupations were less likely to work after state pension age. But after other variables were accounted for, these were no longer significant. This is likely to be explained partly by the effects of income – with those in craft occupations at particular risk of low income in old age (Bardasi and Jenkins,). However, being in mainly personal protective occupations becomes statistically significant after accounting for other factors, increasing the odds of working beyond state pension age.

Table 13 Logistic regression of working beyond state pension age by number and type of main occupation

	Without controls	**With controls**
Number of Occupations		
One occupation	*ref*	*ref*
One change	1.703***	1.737***
Two changes	1.813***	2.139***
Recurrent changes	2.079***	2.218**
Log likelihood:	*2720.422*	*1947.164*
Nagelkerke R Square:	*0.025*	*0.134*
Type of Occupation		
Ever manager	1.545**	1.707**
Ever Professional	1.262**	1.225
Ever associate professional	1.200***	1.217**
Ever Clerical	1.086**	1.077*
Ever Craft	0.017	1.046
Ever Personal protective	1.091***	1.102***
Ever Sales	1.110***	1.090***
Ever Plant operative	0.978	0.999
Ever Other occupation	1.043***	1.053***
Log likelihood:	*3077.501*	*2247.623*
Nagelkerke R Square:	*0.063*	*0.137*
Type of Main Occupation		
No dominant occupation	*ref*	*ref*
Mainly manager	1.294	1.646
Mainly Professional or associate professional	0.960	1.165
Mainly Clerical	1.025	1.234
Mainly Craft	0.597**	0.911
Mainly Personal protective	1.387	1.594*
Mainly Plant operative	0.399***	0.690
Mainly Other occupation	1.092	1.462
Missing occupational data	0.569**	0.113***
Employed less than 25% of working life	0.156***	0.734
Log likelihood:	*3016.118*	*2156.885*
Nagelkerke R Square:	*0.094*	*0.193*

Type of occupation was more important for women than men. For men, ever being a manager and associate professional significantly more likely to work

beyond state pension age, although the effects of ever being a manager were somewhat dampened after accounting for other variables – becoming less significant and with the odds reducing from 2.262 to 1.640. For women ever being a professional, associate professional, clerical, personal protective, sales significantly increases the odds of working beyond state pension age compared to never being in each of these occupations. All expect professional remains important after controls are added. Interestingly, professional remains significant with household income variables. Two professions – managerial and craft – become significant once other factors are accounted for, although these are not significant if household rather than individual income is accounted for. Examining main occupation, occupational type becomes less important as an indicator of working beyond state pension age. For men, only managerial occupations are more likely to work beyond state pension age, although this is no longer significant once income and other factors are accounted for. For women, personal protective is important as an occupation in increasing the odds of working beyond state pension age, and stays significant after factors are taken into account. However, accounting for household rather than personal income makes it no longer significant.

Table 14 Logistic regression of working beyond state pension age (any) by number and type of main occupation

	Men		**Women**	
	Before controls	**After controls**	**Before controls**	**After controls**
Number of Occupations				
One occupation	*ref*	*ref*	*ref*	*ref*
One change	1.482*	1.356	1.816***	1.974***
Two changes	1.421	1.758	2.194***	2.361***
Recurrent changes	2.324**	1.909	2.086***	2.400**
Log likelihood:	*913.049*	*632.355*	*1742.603*	*1281.848*
Nagelkerke R Square:	*0.017*	*0.171*	*0.035*	*0.098*
Type of Occupation				
Ever manager	2.262***	1.640*	1.435	1.630*
Professional	1.230	1.058	1.389**	1.412
Associate prof	1.204*	1.266*	1.233***	1.234**
Ever Clerical	0.907	0.978	1.149***	1.134**
Ever Craft	1.027	0.988	1.061	1.083*
Personal protective	1.007	1.024	1.095***	1.122***
Ever Sales	1.078	1.124*	1.094***	1.090**
Plant operative	0.975	0.986	0.994	1.005
Other occupation	0.981	0.976	1.075***	1.082***
Log likelihood:	*989.980*	*702.830*	*2016.659*	*1488.414*
Nagelkerke R Square:	*0.070*	*0.188*	*0.086*	*0.137*
Type of main Occupation				
No dominant occ	*ref*	*ref*	*ref*	*ref*
Manager	2.736**	1.294	1.695	1.750
Prof or assoc prof	1.687	1.321	1.059	1.013
Mainly Clerical	1.172	1.150	1.134	1.210
Mainly Craft	1.318	0.882	0.784	0.723
Personal protective	1.145	0.848	1.789**	1.939**
Plant operative	0.664	0.577	0.677	0.797

Other occupation	0.934	0.782	1.866**	1.950*
Missing data	0.988	1.006	0.643*	0.576*
Emp less than 25%	1.487	1.402	0.131***	0.111***
Log likelihood:	*1013.611*	*717.244*	*1908.671*	*1398.941*
Nagelkerke R Square:	*0.034*	*0.164*	*0.167*	*0.222*

Interactions

We are interested not only in whether work history is important even after income and other factors are accounted for. But also in how work history *interacts* with income to extend working life. We entered various interaction terms into the regression model to explore how work history *and* income and impacting the odds of extending work. This enables us to understand the impact of work history for different income groups.

Personal income level does not interact with income to influence a decision to work beyond state pension age for women. For men, however, the association between working longer and extending work is much stronger for those with high personal incomes (over £1500) than those with a lower personal income. This is difficult to explain, but certainly reiterates that those with greatest attachment to the labour market and least personal financial necessity to extend working life are more likely to do so. Personal income level does not, however, interact with other indicators of work history, including inactivity duration.

Indeed, it appears that *sources* of pension are more important. This is perhaps not surprising in itself, given that occupational and private pension receipt is closely related to work history, as indicated above.

For men, the association between work history and extending paid work is stronger for those with a private pension income than those without. Thus, longer periods of employment increase the odds of working longer for those with a private pension 69.2 percent more than those without, and longer periods of inactivity decrease the odds by 60.4 percent. Indeed, these affects are stronger than work history alone.

Having an occupational pension is important for influencing the impact that duration of inactivity and caring have upon extending paid work. Given that women with long periods of inactivity are likely to have spent that caring means that these interactions go hand in hand. Indeed, having an occupational pension has virtually the same impact upon extending paid work for durations of inactivity as it does for caring. Thus, longer periods of inactivity and caring slightly increases the odds of extending paid work women for with occupational pensions compared to those without by about 6 percent. Whilst the odds are fairly low, this interaction is highly significant – both statistically and conceptually given that duration of inactivity and caring, and having an occupational pension on their own *decrease* the odds of extending paid work. Thus, having an occupational pension serves to turn these associations on their head.

Occupational pensions are also important for men with short periods of unemployment relative to those with no periods of unemployment. Those unemployed for less than two years with an occupational pension are 3.497 times more likely than those without an occupational pension to extend working life. Having an occupational pension makes the relationship between short periods of unemployment significant when by itself, it is not relevant to working beyond state pension age.

It is worth mentioning that the proportion of time spent in full or part time work does not appear to differ for different income groups – with the interaction effects being insignificant. Thus, full time employment serves to reduce the odds of extending paid work and part time, increase, regardless of income level and source.

We also examined whether current marital status interacted with work history. The effects were generally non significant. However, timing of employment appears to be very important to women who are widowed/ divorced. Working for more than 5 years in their fifties means than widowed/divorced people are 9.133 times more likely than those who are never married to work beyond state pension age.

Table 15: Interactions between work history and income (after controls)

	Men	**Women**
Years employed	1.339***	1.076***
High personal income	0.000*	0.942
Years employed*High personal income	1.264*	0.985
Years employed	1.369**	1.074***
Any Private pension income	0.000*	1.078
Years employed*Any private pension income	1.692*	1.005
Years inactive	0.724***	0.930***
Private Pension	1.914	1.332
Years inactive*Has private Pension	0.396*	0.995
Years inactive	0.379***	0.921***
Occupational Pension	0.688***	0.340***
Years inactive*Has occupational Pension	1.011	1.060***

Years inactive due to caring	-	0.463***
Occupational Pension	-	0.340***
Years caring*Has occupational Pension	-	1.068***
Years inactive due to being unemployed / sick		
none	Ref	ref
Less than two years	0.425*	1.774*
Two or more years	0.121**	0.416*
Occupational Pension	0.265***	1.054
Less than two years unemployed*Has occupational Pension	3.497*	0.780
Two or more years unemployed*Has occupational Pension	3.674	0.939
Timing of employment by marital status		
Did not work late		ref
Worked late		3.301
Never married		ref
Married		0.709
Divorced/ widowed		0.265*
Never married		ref
Worked late*Married		3.121
Worked late*Divorced/ widowed		9.133**

Impact of family history upon working beyond state pension age

Next, we examine marital and fertile history to understand how they influence a decision to work after state pension age.

Marital history

First, we examined the whether being ever married, divorced (or separated) or widowed impacted upon the odds of extending working life (table 16). We can see that older people who have been ever married were 1.5 times more likely to work beyond state pension age. This is only just significant, and does not remain so taking into account personal income and other factors, indicating that other factors are more important than being married per se in extending working life. Ever being divorced or widowed do not significantly impact upon working past state pension age.

Duration of marriage has been measured by examining the proportion of working life married. We find that being married for at least 50 percent of working life significantly increases the odds of working beyond state pension age, whilst being married for less than this is not significant. However, after other factors are controlled for, duration of marriage is no longer important for influencing the odds of working beyond state pension.

Timing of first marriage is also important – with those first married in their early 20s or later 20s being significantly more likely to work after state pension age than those who have never married. This may reflect the difficulties of building a career for older women who marry earlier, increasing the necessity of working late, especially given the lower educational qualifications for those who marry (and leave education) earlier. Indeed, after other factors are controlled for, timing of marriage no longer becomes important.

Marital history is examined more closely by understanding the impact of divorce – ie. timing of divorce and marital history post divorce. In line with the previous observations, marrying, and remaining married increases the chances of extending working life by 49.4 percent but this is accounted for by other socio economic factors.

Timing of divorce is not significant, although marital history post divorce is. Whilst remarry post divorce does not impact significantly on a decision to work beyond state pension age, remaining single post divorce does - significantly increasing the chances by 77 percent. This stays statistically significant even after other socio-economic and health factors are controlled for, and the odds increase to 2.159, indicating that divorced single people may be extending working life for some unobserved reason – such as to maintain a social life.

Taking into account timing of divorce aswell demonstrates that divorcing pre-40s and staying single has more impact than divorcing post-40s and staying single. Thus, the odds of those working beyond state pension age for those under 40 are 2.888, and this is highly significant. But the odds for those divorcing over 40 and remaining single are 1.618, which is only just significant. Moreover, the

increased likelihood of working beyond state pension age for those divorcing over 40 can be explained by other the observed factors, but divorcing post 40 and staying single remains just significant after these factors are accounted for and the odds increase to 3.153. Thus, even after taking into account other factors, remaining single for longer post divorce is important for increasing the likelihood of working beyond state pension age.

Table 16: Logistic regression for the odds of working beyond state pension age by marital history

	Without controls	**With controls**
Never married	*Ref*	*Ref*
Ever married	*1.501**	*1.770*
Never divorced	*ref*	*ref*
Ever divorced	*1.009*	*1.107*
Never widowed	*ref*	*ref*
Ever widowed	1.019	0.975
Log likelihood:	*3190.823*	*2320.105*
Nagelkerke R Square:	*0.004*	*0.090*
Proportion of years married		
Never married	*ref*	*ref*
Married for under 25%	1.595	1.677
Married 25% - 50%	1.443	1.838
50% - 75%	1.569*	1.795
75% to 99.99%	1.453*	1.695
All working life	1.609*	1.786
Log likelihood:	*3190.703*	*2320.611*
Nagelkerke R Square:	*0.004*	*0.090*
Timing of marriage		
Never married	*ref*	*ref*
Early 20s	1.539**	1.714
Late 20s	1.488*	2.017
Over 30	1.416	1.803
Log likelihood:	*3190.406*	*2318.934*
Nagelkerke R Square:	*0.004*	*0.091*
Timing of divorce		
Never divorced, separated or widowed	*ref*	*ref*
Under 40s	1.297	1.166
Over 40s	1.014	1.022
Log likelihood:	*3195.953*	*2322.866*
Nagelkerke R Square:	*0.001*	*0.088*
Pattern of divorce		
Never divorced, separated or widowed	*ref*	*ref*
Remarried	1.212	1.480
Stayed single	1.771**	2.159*
Ever married, stayed married	1.494*	1.753
Log likelihood:	*3186.265*	*2317.630*
Nagelkerke R Square:	*0.006*	*0.092*

Timing and pattern of divorce		
Never divorced, separated or widowed	*ref*	*ref*
Under 40s and remarried	1.316	1.499
Under 40s, stayed single	2.888***	3.153*
Over 40s and remarried	1.100	1.451
Over 40s, stayed single	1.618*	2.020
Ever married, stayed married	1.494*	1.749
Log likelihood:	*3181.910*	*2316.076*
Nagelkerke R Square:	*0.009*	*0.093*

Marital history and sex

Examining marital history according to sex reveals dramatic differences. For men, marital history was not significant before controls were added. After controls were accounted for, however, ever being married becomes significant. This indicates that the factors controlled for are more important in influencing working beyond state pension age than marital history for men. However, once they are controlled for, ever being marriage significantly decreases the chances of working after state pension age by 86.2% compared to never being married, regardless of age married. For those men who have divorced, remarrying also reduces the chances of working beyond state pension age after certain variables are controlled for, but only if divorced after the age of 40. It is likely that work history is important in explaining this, with these groups of men having particular work histories that indirectly influence working beyond state pension age via income and other factors – and thus only becomes important in itself once these factor are controlled for. Thus, marriage for may be an indirect indicator of working beyond state pension age.

For women, however, marital history has a much greater impact. Being ever married significantly increases the likelihood of working beyond state pension age by 2.218 before controls and once various factors are accounted for, being married is slightly less significant but the odds increase to 5.084. This is the case regardless of the age women married. This is likely to be reflective of the work histories of married women. On the one hand, less of their working life is spent in full time work than never married women, and thus they are less able to build up a decent level of personal income in old age. On the other hand,

Whilst being ever divorced (including timing of divorce) is not significant in itself, marital history post divorce is. Thus, women who stay single after divorce are 2.344 times more likely to work beyond state pension age, which increases to 5.849 after controls are accounted for, although it becomes slightly less significant. Those who divorce but remarry were not sigifnicantly more likely to work beyond state pension age until various variables were controlled for, although the odds are not as high as those who stay single. This may reflect their work history – with limited labour market attachment whilst married and double disadvantage owork history whilst married and However, Sefton et al found that divorced people were more likely to have longer work histories

Table 17: Logistic regressions for the odds of working beyond state pension age by marital history for men and women

	Men Before controls	After controls	Women Before controls	After controls
Never married	*Ref*	*Ref*	*Ref*	*Ref*
Ever married	*0.774*	*0.138**	*2.218****	*5.084***
Never divorced	*ref*	*ref*	*ref*	*ref*
Ever divorced	*1.186*	*1.249*	*0.917*	*1.055*
Never widowed	*ref*	*ref*	*ref*	*ref*
Ever widowed	0.816	0.964	0.922	0.927
Log likelihood:	*1033.863*	*714.308*	*2105.913*	*1550.905*
Nagelkerke R Square:	*0.003*	*0.168*	*0.014*	*0.074*
Proportion of years married				
Never married	*ref*	*ref*	*ref*	*ref*
Married for under 25%	1.037	0.144	1.968	4.052* ns
Married 25% - 50%	0.614	0.153	2.055*	5.180**
50% - 75%	0.875	0.138*	2.165**	5.195**
75% to 99.99%	0.763	0.134*	2.134***	4.852**
All working life	0.484	0.085 js	1.959*	4.954**
Log likelihood:	*1033.505*	*714.081*	*2107.305*	*1551.526*
Nagelkerke R Square:	*0.004*	*0.168*	*0.013*	*0.073*
Timing of marriage				
Never married	*ref*	*ref*	*ref*	*ref*
Early 20s	0.697	0.124*	2.115***	4.942**
Late 20s	0.812	0.177*	2.427***	5.626**
Over 30	0.888	0.158*	2.041**	4.773**
Log likelihood:	*1033.431*	*712.166*	*2105.406*	*1550.489*
Nagelkerke R Square:	*0.004*	*0.171*	*0.015*	*0.074*
Timing of divorce				
Never divorced, separated or widowed	*ref*	*ref*	*ref*	*ref*
Under 40s	0.939	0.952	1.232	1.257
Over 40s	0.983	1.058	0.953	0.987
Log likelihood:	*1035.830*	*721.373*	*2121.654*	*1563.352*
Nagelkerke R Square:	*0.000*	*0.155*	*0.001*	*0.061*
Pattern of divorce				
Never married	*ref*	*ref*	*ref*	*ref*
Remarried	0.778	0.138*	1.561	3.800*
Stayed single	0.777	0.182	2.344***	5.849**
Ever married, stayed married	0.774	0.138*	2.206***	5.041**
Log likelihood:	*1034.885*	*714.272*	*2102.542*	*1548.515*
Nagelkerke R Square:	*0.002*	*0.168*	*0.017*	*0.076*
Pattern and timing of divorce				
Never divorced, separated or widowed	*ref*	*ref*	*ref*	*ref*
Under 40s and remarried	0.914	0.175	1.581	3.531*
Over 40s, remarried	0.694	0.117*	1.530	9.299**

Under 40s, stayed single		0.185	4.020***	4.178*
Over 40s, stayed single	0.777		2.084**	5.317**
Ever married, stayed married	0.774	0.139*	2.206***	4.991**
Log likelihood:	*1034.598*	*713.855*		*1546.177*
Nagelkerke R Square:	*0.002*	*0.168*		*0.079*

Fertility history

Having children is also important for working beyond state pension age. Having 1,2 of 3 children compared to having none increases working beyond state pension age by about 50 percent – with little difference in the odds. This remains just significant after controls are accounted for, which suggests that having three or less children influences extending work for other unobserved factors. But having 4 or 5 or more does not significantly impact upon extending work.

Timing of the first born is not important but timing of the last is, suggesting that family completion is important for working later. Completing a family in ones early 20s reduces the chances of working beyond state pension age by about a third relative to completing one in the late 20s. This is still significant after accounting for other factors, with the odds hardly changing. Completing a family in the ones early 20s has important implications for work history, perhaps being more likely to remain inactive for longer periods to undertake care given the limited period prior to completing the family to build a career. Completing a family later – after age 30 has no bearing on working after state pension age.

Having no children also reduces the likelihood of extending working life compared to completing ones family in the late 20s, even after other factors are accounted for. It is likely that those people without children undertake full-time careers, which are least associated with working beyond state pension age. But those with children may be extending work life for bequest motives or to help children financially.

Table 18: Logistic regression examining the odds of working beyond state pension age by fertility history

	Without controls	**With controls**
Number of children		
0	*ref*	*ref*
1	1.568**	1.538*
2	1.558**	1.573*
3	1.506**	1.518*
4	1.339	1.366
5+	0.891	0.976
Log likelihood:	*3176.965*	*2311.740*
Nagelkerke R Square:	*0.011*	*0.095*
First born		
Late 20s	*ref*	*ref*
No children	0.707**	0.694*
Early 20s	0.998	0.931

Early 30s	1.163	1.239
Late 30s or older	1.189	1.282
Log likelihood:	*3184.507*	*2312.919*
Nagelkerke R Square:	*0.007*	*0.095*
Last born		
Late 20s	ref	*ref*
No children	0.608***	0.608**
Early 20s	0.678*	0.613*
Early 30s	0.878	0.902
Late 30s or older	0.804	0.906
Log likelihood:	*3181.207*	*2310.799*
Nagelkerke R Square:	*0.009*	*0.096*

Fertility history and sex

Fertility history reveals how having children has no significant effect upon working beyond state pension age for men, presumably because, for this age group, women were most likely to take on childcare responsibilities with the subsequent impact upon work histories and income. Indeed, for women, having children impacts upon a decision to work beyond state pension age. But the effect is curvilinear, with significantly higher odds of working for those with up to three children (although the odds are slightly lower for those with three compared to two), and with an insignificant association for women with four or five or more children. Whilst having large families is associated with lower income (Bradshaw et al, 2006), indicating a financial need to work beyond state pension age to boost this income. It is also likely that the caring responsibilities that having a large family brings and the subsequent impact upon work history means that these women have little negotiating power to enable working beyond state pension age, despite a possibly increase financial need. We have seen above how long periods of family care significantly reduce the odds of working beyond state pension age, even after income and other factors are controlled for.

Increasing pension income is likely to be a motivation for those with smaller families working longer. Women with smaller families are more likely to retain some attachment to the labour market after having children but broken work histories combined with higher propensity to work part time after having children will mean that these mothers have lower personal pension income but with the negotiating power to enable them to work longer to boost their pension income. However, those mothers with higher education are more likely to work more and earn a higher income even after having children (ref). Thus reducing the impact that children have upon income.

Controlling for other factors means that mother one or three children are no longer significantly more likely to work beyond state pension age. Thus, working beyond state pension age for these mothers is accounted for educational, financial, health and other reasons for working beyond state pension age. However, having two children remains important - becoming less significant statistically but with slightly increased odds, even after controlling for other factors.

Timing of children, notably timing of family completion, is important in a decision to work beyond state pension age. It may be that those with completing early (in your early 20s) significantly reducing the chances of working beyond state pension age.

Table 19: Logistic regression of working beyond state pension age by fertility history for men and women

	Men		**Women**	
	Before Controls	**After controls**	**Before controls**	**After controls**
Number of children				
0	*ref*	*ref*	*ref*	*ref*
1	1.531	1.637	1.542*	1.570
2	1.146	1.214	1.771***	1.803**
3	1.528	1.565	1.464*	1.555
4	1.124	1.079	1.459	1.526
5+	0.669	0.930	0.900	1.018
Log likelihood:	*1028.297*	*716.533*	*2104.662*	*1553.549*
Nagelkerke R Square:	*0.011*	*0.163*	*0.015*	*0.071*
First born				
Late 20s	*ref*	*ref*	*ref*	*ref*
No children	0.793	0.747	0.638**	0.647
Early 20s	0.711	0.707	0.906	0.970
Early 30s	1.235	1.236	1.166	1.273
Late 30s or older	1.485	1.318	1.089	1.288
Log likelihood:	*1027.002*	*716.279*	*2111.373*	*1555.593*
Nagelkerke R Square:	*0.014*	*0.164*	*0.010*	*0.069*
Last born				
Late 20s	ref	ref	*ref*	*ref*
No children	0.675	0.590	0.623**	0.618*
Early 20s	0.779	0.843	0.612*	0.565*
Early 30s	0.739	0.638	1.014	1.073
Late 30s or older	1.024	1.034	0.790	0.871
Log likelihood:	*1030.447*	*715.117*	*2106.630*	*1550.433*
Nagelkerke R Square:	*0.008*	*0.166*	*0.014*	*0.074*

Marital and fertility history

It is important to examine the combination of marital and fertility history to understand their affects on working beyond state pension age (table 20). Not having children no longer reduces the chances of extending working life if marital history is accounted for. Being married with no children, regardless of when you married, has no significant impact upon working after state pension age compared to never marrying. However, having children increases the chances of working beyond state pension age for older people that had ever been

married people, regardless of timing of marriage. The odds of extending working life are increased the least by those with children who married in their late 20s (1.518) and those most by those who married after 30 (1.614). Before 30, the effects are no longer significant after the controls are accounted for. However, those married after 30 with children are significantly more likely to work beyond state pension age even after other factors are accounted for and the odds increase to 2.158. This indicates that work history may play a part – with this group perhaps waiting to settle down and have children until they have built up a career, and less likely to be inactive after having children – and more able to negotiate working beyond state pension age as a result. However, for women, having children, regardless of the age married remains significant after other factors are accounted for (table 21).

Next, we examined the impact that children have upon divorce (tables 20 and 21). For women, remaining single with children present significantly increases the chances of working longer, especially if marital break down or widowhood occurred before the age of 40 – increasing the odds by more than tenfold. Thus, it is likely that the double disadvantage of broken work history and no partner's income to sustain them in old age increases the likelihood of this group working longer.

Table 20: Logistic regression examining the odds of working beyond state pension age by marital and fertility history combined

	Without controls	**With controls**
Marital and fertile history		
Not married	*ref*	*ref*
Married early 20s, children	1.573**	1.756
Married late 20s, children	1.518*	2.063
Married over 30, children	1.614*	2.158*
Married early 20s, no children	1.134	1.187
Married late 20s, no children	1.303	1.662
Married over 30, no children	1.023	1.152
Log likelihood:	3185.002	2312.272
Nagelkerke R Square:	0.007	0.095
Divorce history and having children		
Never divorced, separated or widowed	*Ref*	*ref*
Under 40s and remarried, children	1.282	1.463
Over 40s and remarried, children	1.146	1.544
Under 40s, stayed single, children	3.162***	3.537*
Over 40s, stayed single, children	1.669**	2.149*
Ever married, stayed married, children	1.555**	1.803
Under 40s and remarried, no children	1.517	1.626
Over 40s and remarried, no children	0.730	0.860
Under 40s, stayed single, no children	0.913	1.158
Over 40s, stayed single, no children	1.302	
Ever married, stayed married, no children	1.097	1.205
Log likelihood:	3181.910	2316.076
Nagelkerke R Square:	0.009	0.093

Table 20: Logistic regression for working beyond state pension age by marital and fertility history for men and women

	Men		Women	
	Before controls	After controls	Before controls	After controls
Marital and fertile history				
Not married	ref	ref	ref	ref
Early 20s, children	0.705	0.125*	2.171***	5.083**
Late 20s, children	0.851	0.188*	2.422***	5.579**
Over 30, children	1.039	0.196	2.278**	5.638**
Early 20s, no children	0.602	0.101*	1.477	3.291
Log likelihood:	*1030.352*	*708.591*	*2102.151*	*1546.506*
Nagelkerke R Square:	*0.009*	*0.178*	*0.017*	*0.078*
Divorce and fertile history				
Never divorced, separated or widowed	ref	ref	ref	ref
Under 40s and remarried, children	0.884	0.190	1.540	3.366
Over 40s and remarried, children	0.745	0.144*	1.540	4.120*
Under 40s, stayed single, children	0.823	0.199	4.348***	10.332***
Over 40s, stayed single, children			2.134**	5.602**
Under 40s and remarried, no children	1.056	0.111	1.855	4.351
Over 40s and remarried, no children	*0.415*	*0.037**	*1.391*	4.865
Under/ over 40s, stayed single, no children	*0.528*	*0.088*	*1.723*	*3.203*
Ever married, stayed married, children	0.582	0.142*	2.276***	*5.136***
Ever married, stayed married, no children	*0.807*	*0.105***	*1.690*	*3.646**
Log likelihood:	*1032.542*	*710.848*	*2094.675*	*1541.767*
Nagelkerke R Square:	*0.005*	*0.174*	*0.023*	*0.083*

Interactions between work and family history

Income does not interact with family history to increase the chances of working beyond state pension age.

However, at least for men, work and family history interact to influence working beyond state pension age. Work history is matters more for married men with children than those never married. For married men with children, being in paid work for longer period before state pension age increases the odds of working beyond by 44.2 percent more than those who never married. It serves to reason then that for married men with children, being inactive for longer during working life reduces the odds of extending work by 35 percent compared to those men never married. Work history is insignificant for married men without children. For women, work history does not interact with family history to influence working beyond state pension age, which suggests that marital history per se is important to women, and not necessarily how it indirectly impacts upon work history.

Table 21: Interactions between work and family history

	Before Controls	After controls
Years employed	1.135	1.081*
Marital and fertile history		
Not married	ref	ref
Married, children	0.000**	3.182
Married, no children	0.016	5.255
Marital and fertile history		
Years employed*Not married	ref	ref
Years employed *Married, children	1.442***	1.007
Years employed*Married, no children	1.037	0.956
Years inactive	0.886	0.906**
Marital and fertile history		
Not married	ref	ref
Married, children	0.183	3.378
Married, no children	0.071**	0.822
Marital and fertile history		
Years inactive*Not married	ref	ref
Years inactive*Married, children	0.650***	1.015
Years inactive*Married, no children	0.987	1.061

Work and family history and number of years worked after state pension age

We were also interested to understand not just how work and family history impact working or not after state pension, but the effect they have upon the number of years worked after state pension age, shown in tables 22. This analysis was undertaken with extenders only. Fewer indicators of work and family history influenced upon working longer than influenced whether or not to work atall.

The aspects of work history that predict the number of years that extenders worked after state pension age are number of occupations and self employment. Each additional occupation worked in during working life reduces the number of years worked past state pension age by -0.029 years. This, however, is no longer significant after other factors are accounted for. However, examining the predictors of working longer by sex show that the number of occupations worked prior to state pension age negative associations with the number of years worked after state pension age, even after other factors were accounted for.

For each additional percentage of working life spent in self employment, the number of years worked after state pension age increases by 1.467 – even after controlling for other factors.

Marital, but not fertility history, predicts the number of years that extenders worked after state pension age. Each had small effects upon the number of years worked beyond state pension age, and were not always significant even after controlling for other factors. Each additional marriage decreased the number of years worked after state pension age by 0.621 years, although this was not significant after controlling for other factors. Getting married a year later, increased the number of years worked 0.046 years after other factors were controlled for. Becoming divorced or widowed a year later, increased the number of years by 0.017, but not after other factors were taken into account. Thus family history has very marginal effects upon the number of years worked after state pension age.

Table 22: OLS regression analysis – Predictors of working longer after state pension age for extenders

	Without controls	With controls
Number of occupations	*-0.029***	*-0.021*
Constant	*4.046****	*6.180****
R Squared:	*0.011*	*0.037*
Proportion of working life self employed	1.325**	1.467*
Constant	*3.097****	*4.462****
R Squared:	*0.009*	*0.042*
Number of marriages	-0.621*	-0.513
Constant	*3.867****	*5.244****
R Squared:	*0.004*	*0.034*
Age married	*0.014*	*0.046**
Constant	*2.909****	*4.740****
R Squared:	*0.000*	*0.040*
Age widowed/divorced	*0.017****	*0.008*
Constant	*2.786****	*5.094****
R Squared:	*0.019*	*0.033*

Conclusion

This research examines the relationship between work-family life history and working beyond state pension age (SPA) using retrospective data from the first 14 waves of the British Household Panel Survey. It found that work and family history are important for predicting whether someone will work after SPA, even after income is accounted for.

Attachment to the labour market prior to SPA influences extending work thereafter. For women, breaking from paid work to undertake long periods of family care reduces the likelihood of working beyond SPA. For men, even relatively short periods of inactivity, makes a difference. Dis-attachment from the labour market late in working life is crucial for reducing the likelihood of extending work. Thus, those most in need of working longer for financial reasons are less likely to do so, perhaps due to less negotiating power in the labour market to enable them to do so.

Marital and fertility history per se are less important for men than women in terms of influencing working beyond SPA. For women, staying married increases the chances of working longer, but lowers it for men. Divorce in itself is not a predictor of extending work – it is marital history post divorce, notably remaining single with children present, that matters. Thus, it is likely that the double disadvantage of broken work history and no partner's income to sustain them in old age increases the likelihood of this group working longer.

Further research is required to examine the relationship between partner's work histories and working beyond state pension age. For example, men with high personal incomes might work longer not to build up income for themselves, but to make up for their partner's broken work histories. Since women with very broken work histories are less able to extend paid work, possibly due to lack of experience or negotiating power within the labour market, it may be that their partners, with greater labour market attachment, work longer instead, despite high personal income.

APPENDIX

A1: Working beyond state pension age and personal income

Table 1: Logistic regressions for the odds of married, widowed/divorced and never married working beyond state pension age according to personal income (before controls)

Financial expectations for the year ahead	Married	Widowed/ Divorced	Never married
About the same	*ref*	*ref*	*ref*
Better than now	0.908	0.913	0.862
Worse than now	0.833	0.921	1.037
Non labour income			
Under £750	*ref*	*ref*	*ref*
£750 to £1000	0.591**	0.863	1.174
£1000 to £1500	0.362***	0.894	0.881
£1500+	0.454***	0.694	1.133
Occupational pension income			
None	*ref*	*ref*	*ref*
Some	0.846	0.928	0.586
Private pension income			
None	*ref*	*ref*	*ref*
Some	1.797**	1.637	2.259
Investment /saving income			
None	*ref*	*ref*	*ref*
Some	1.173	1.371*	1.666
Income support income			
None	*ref*	*ref*	*ref*
Some	0.486	0.721	0.690
Log likelihood:	*1585.597*	*1067.135*	*170.730*
Nagelkerke R Square:	*0.064*	*0.018*	*0.044*

A2: Working beyond state pension age and household income

Table 2: Logistic regression for working beyond state pension age according to household income

Financial expectations for the year ahead	Without controls	With controls
About the same	*ref*	*ref*
Better than now	0.882	0.827
Worse than now	0.890	0.820
Non labour household income		
Under £750	*ref*	*ref*
£750 to £1000	0.729	0.773
£1000 to £1500	0.700*	0.788
£1500+	0.542***	0.568**
Pension income		
None	*ref*	*ref*
Some	0.882	0.870
Investment /saving income		
None	*ref*	*ref*

Some	1.350**	1.269
Benefit income		
None	*ref*	*ref*
Some	0.750	0.827
Log likelihood:	*2776.555*	*2232.877*
Nagelkerke R Square:	*0.019*	*0.083*

Table 3: Logistic regression for working beyond state pension age according to household income for men and women

	Men		Women	
	Before controls	After controls	Before controls	After controls
Financial expectations for the year ahead				
About the same	*ref*	*ref*	*ref*	*ref*
Better than now	0.968	0.838	0.823	0.807
Worse than now	1.076	0.927	0.766	0.764
Non labour household income				
Under £750	*ref*	*ref*	*ref*	*ref*
£750 to £1000	0.692	0.688	0.758	0.777
£1000 to £1500	0.544	0.587	0.839	0.873
£1500+	0.394**	0.401*	0.623*	0.648
Pension income				
None	*ref*	*ref*	*ref*	*ref*
Some	0.692	0.585*	1.078	1.014
Investment /saving income				
None	*ref*	*ref*	*ref*	*ref*
Some	1.600*	1.355	1.308*	1.346
Benefit income				
None	*ref*	*ref*	*ref*	*ref*
Some	0.498	0.304	0.879	0.943
Log likelihood:	*2776.555*	*687.177*	*2232.877*	*1515.439*
Nagelkerke R Square:	*0.019*	*0.132*	*0.083*	*0.056*

Table 4: Logistic regression for working beyond state pension age according to household income by marital status (before controls)

Financial expectations for the year ahead	Married	Widowed/ divorced	Never married
About the same	*ref*	*ref*	*ref*
Better than now	0.892	0.835	0.883
Worse than now	0.857	0.900	2.040
Non labour household income			
Under £750	*ref*	*ref*	
£750 to £1000	0.581	1.318	0.912
£1000 to £1500	0.556**	1.354	0.403
£1500+	0.380***	0.954	0.831
Pension income			
None	*ref*	*ref*	
Some	0.930	0.956	0.635
Investment /saving income			
None	*ref*	*ref*	
Some	1.407*	1.422*	1.766

Benefit income			
None	*ref*	*ref*	
Some	0.905	0.292	3.511
Log likelihood:	*1508.023*	*1046.454*	*165.744*
Nagelkerke R Square:	*0.034*	*0.016*	*0.037*

Table 5: Logistic regression for working beyond state pension age according to household income by marital status (after controls)

Financial expectations for the year ahead	Married	Widowed/ divorced	Never married
About the same	*ref*	*ref*	*ref*
Better than now	0.721	0.775	0.606
Worse than now	0.755	0.857	0.702
Non labour household income			
Under £750	*ref*	*ref*	
£750 to £1000	0.564	1.298	0.624
£1000 to £1500	0.608	1.346	0.277
£1500+	0.396***	0.974	0.373
Pension income			
None	*ref*	*ref*	
Some	0.849	0.902	0.790
Investment /saving income			
None	*ref*	*ref*	
Some	1.247	1.432	1.374
Benefit income			
None	*ref*	*ref*	
Some	0.866	0.410	1.308
Log likelihood:	*1203.120*	*880.098*	*122.429*
Nagelkerke R Square:	*0.089*	*0.043*	*0.230*

A3: Duration and timing of employment, and the impact upon state pension age for women

Table 6: Logistic regression for the odds of women working beyond state pension age by duration and timing of employment for women

Duration and timing of employment	*Before controls*	*After controls*
Mostly inactive throughout	*ref*	*ref*
Active throughout / retires early	13.911***	17.710***
Mostly active, retires early	1.173	1.603
Mostly active with mid career break	19.776***	23.933***
Mostly active with early career break	17.578***	20.247***
Extended early	1.538	1.785
Extended interrupted	15.197***	17.155***
Extended late	20.532***	23.842***
Short early	1.697	1.628
Short mid	1.701	1.892
Short late	35.756***	39.354***

Log likelihood:	*1692.880*	*1239.522*
Nagelkerke R Square:	*0.315*	*0.349*

A4 Employment history and post retirement marital status

Table 7: Logistic regression of working beyond state pension age by type and duration of employment by marital status – before controls

	Married	**Wid/ Divorced / Separated**	**Never married**
Number of years in employment			
Employed less than 25 years	*ref*	*ref*	*ref*
Employed 25-30 years	2.355***	2.995***	3.072
Employed 30-35 years	1.921**	2.469***	0.772
Employed 35-40 years	1.055	2.588***	2.432
Employed 40-45 years	1.535**	1.455	4.275*
Log likelihood: Nagelkerke R Square:	*1741.609 0.025*	*1142.037 0.055*	*185.417 0.066*
Type of contract			
Mainly full time	*ref*	*ref*	*ref*
Mainly part time	2.746***	3.823***	3.803**
Mixed	5.565***	2.893***	
Log likelihood: Nagelkerke R Square:	*1666.430 0.064*	*1049.307 0.101*	*181.154 0.067*
Never full time employed	*Ref*	*Ref*	*ref*
Ever employed full time	*0.938*	*1.394*	*1.101*
Never part time employed	*ref*	*ref*	*ref*
Ever employed part time	*3.607****	*4.636****	*4.498***
Never self employed	*ref*	*ref*	*ref*
Ever self employed	2.644***	2.999***	4.185**
Log likelihood: Nagelkerke R Square:	*1634.809 0.129*	*1055.140 0.174*	*175.569 0.143*
Active for less than 25 years	*ref*	*ref*	*ref*
Short career, mostly part time	6.055***	8.641***	-
Short career, Mixed	4.510***	7.352***	8.167**
Long career, mostly part time	7.860***	16.930***	10.425*
Long career, Mixed	5.864***	7.337***	
Short career, mostly full time	2.865***	2.763***	1.529
Long career, mostly full time	2.109**	3.025***	2.309
Log likelihood: Nagelkerke R Square:	*1670.631 0.097*	*1057.223 0.171*	*183.273 0.083*

Table 8: Logistic regression of working beyond state pension age by type and duration of employment for men and women – after controls

	Married	**Wid/ Divorced / Separated**	**Never married**
Number of years in employment			
Employed less than 25 years	*ref*	*ref*	*ref*
Employed 25-30 years	2.796***	2.611***	5.180
Employed 30-35 years	3.103***	2.568***	0.765

Employed 35+ years	4.500***	4.901***	4.122
Log likelihood:	*1191.231*	*839.640*	*119.430*
Nagelkerke R Square:	*0.188*	*0.136*	*0.293*
Type of contract			
Mainly full time	*ref*	*ref*	*ref*
Mainly part time	1.902**	3.961***	5.769*
Mixed	2.074***	3.221***	
Log likelihood:	*1185.907*	*791.452*	*115.367*
Nagelkerke R Square:	*0.169*	*0.152*	*0.308*
Never full time employed	*Ref*	*Ref*	*ref*
Ever employed full time	*0.989*	*1.369*	*0.758*
Never part time employed	*ref*	*ref*	*ref*
Ever employed part time	*3.365***	*4.874***	*9.181***
Never self employed	*ref*	*ref*	*ref*
Ever self employed	2.510***	3.015***	6.689*
Log likelihood:	*1172.641*	*799.781*	*108.247*
Nagelkerke R Square:	*0.213*	*0.204*	*0.387*
Active for less than 25 years	*ref*	*ref*	*ref*
Short career, mostly part time	5.938***	10.563***	-
Short career, Mixed	4.918***	8.658***	27.797
Long career, mostly part time	8.012***	17.608***	14.553*
Long career, Mixed	11.781***	13.846***	
Short career, mostly full time	4.292***	3.354***	1.275
Long career, mostly full time	6.327***	5.397***	2.360
Log likelihood:	*1164.491*	*778.239*	*117.774*
Nagelkerke R Square:	*0.222*	*0.238*	*0.307*

Table 9: Logistic regression of working beyond state pension age (any) by type and duration of inactivity - before controls

	Married	**Widowed/ Divorced/ Separated**	**Never Married**
Number of years inactive			
Inactive for less than 6 months	*ref*	*ref*	*ref*
Inactive for 6 months to 2 years	0.283***	0.624	0.268*
Inactive 2 years to 15 years	0.355***	0.733	0.095**
Inactive 15 or more years	0.250***	0.320***	0.096***`
Log likelihood: Nagelkerke R Square:	1693.306 *0.076*	*1142.016* *0.058*	*159.816* *0.257*
Type of Inactivity			
Did not retire early	*ref*	*ref*	
Retired Early <2 years	0.070***	0.052***	0.065**
Retired Early >2 years	0.040***	0.025***	0.015***
Was not unemployed/ sick	*ref*	*ref*	
Unemployed or disabled <2 years	859	1.914	2.929

2+ years	104***	0.138	0.319
No family care		*ref*	
<5 years	2.444**	3.294***	
5-10 years	2.282**	2.371**	0.535
10-20 years	1.760**	2.497***	
20+ years	0.318***	0.362***	
Never other inactive	*ref*	*ref*	*ref*
Ever other inactive	1.213	0.091	0.939
Log likelihood: Nagelkerke	*1262.850*	*108.017*	*131.997*
R Square:	*0.419*	*0.519*	*0.437*

Table 10 Logistic regression of working beyond state pension age by type and duration of inactivity – after controls

	Married	**Widowed/ Divorced/ Separated**	**Never Married**
Number of years inactive			
Inactive for less than 6 months	*ref*	*ref*	*ref*
Inactive for 6 months to 2 years	0.156***	0.416*	0.162*
Inactive 2 years to 15 years	0.141***	0.352**	0.056***
Inactive 15 or more years	0.045***	0.130***	0.074*`
Log likelihood: Nagelkerke R Square:	1103.772 *0.286*	*832.981 0.150*	*103.833 0.423*
Type of Inactivity			
Did not retire early	*ref*	*ref*	
Retired Early <2 years	0.058***	0.045***	0.005**
Retired Early >2 years	0.042***	0.020***	0.004***
Was not unemployed/ sick	*ref*	*ref*	
Unemployed or disabled <2 years	0.891	2.056	5.146
2+ years	164***	0.160**	0.235
No family care		*ref*	
<5 years	1.849	2.095	
5-10 years	1.631	1.564	0.291
10-20 years	1.171	1.566	
20+ years	0.226***	0.239***	
Never other inactive	*ref*	*ref*	*ref*
Ever other inactive	1.259	0.802	0.583
Log likelihood: Nagelkerke R Square:	*916.774 0.461*	*624.102 0.456*	*75.254 0.626*

Table 11: Logistic regression of working beyond state pension age (any) by number and type of main occupation – no controls

	Married	Divorced/ Separated	Never Married
Number of Occupations			
One occupation	*ref*	*ref*	*ref*
One change	1.461**	2.156***	1.564
Two changes	1.565**	3.363***	1.463
Recurrent changes	1.957**	2.811**	0.794
Log likelihood: Nagelkerke R Square:	*1573.747 0.015*	*939.027 0.050*	*158.942 0.012*
Type of Occupation			
Ever manager	1.485*	1.712*	1.803
Ever Professional	1.140	1.247	1.938*
Ever associate professional	2.228***	1.203*	1.047
Ever Clerical	1.067*	1.142**	0.998
Ever Craft	1.020	1.027	0.915
Ever Personal protective	1.002**	1.111**	1.146
Ever Sales	1.107***	1.100**	1.187
Ever Plant operative	0.970	1.006	0.739*
Ever Other occupation	1.029	1.072***	0.968
Log likelihood: Nagelkerke R Square:	*1714.248 0.057*	*1123.098 0.084*	*172.059 0.169*
Type of Occupation			
No dominant occupation	*ref*	*ref*	*ref*
Mainly manager	1.279	1.051	2.270
Mainly Professional or associate professional	1.120	0.846	0.480
Mainly Clerical	0.992	1.483	0.452
Mainly Craft	0.712	0.541*	0.052*
Mainly Personal protective	1.416	1.474	0.597
Mainly Plant operative	0.448**	0.456*	0.241
Mainly Other occupation	0.993	1.355	
Missing occupational data	0.493**	0.626	0.528
Employed less than 25% of working life	0.174***	0.135***	0.204
Log likelihood: Nagelkerke R Square:	*1698.898 0.071*	*1076.539 0.146*	*177.514 0.128*

Table 12 Logistic regression of working beyond state pension age (any) by number and type of main occupation – after controls

	Married	Divorced/ Separated	Never Married
Number of Occupations			
One occupation	*ref*	*ref*	*ref*
One change	1.434*	2.213***	1.657
Two changes	1.852**	2.565**	1.767
Recurrent changes	1.790	2.944*	0.946
Log likelihood:	*1082.278*	*696.966*	*103.563*
Nagelkerke R Square:	*0.171*	*0.123*	*0.261*
Type of Occupation			
Ever manager	1.568*	1.774	2.745
Ever Professional	1.064	1.349	3.502
Ever associate professional	1.247**	1.211	1.140
Ever Clerical	1.044	1.126*	1.165
Ever Craft	1.038	1.072	0.924
Ever Personal protective	1.086**	1.116**	1.218
Ever Sales	1.077*	1.086*	1.510**
Ever Plant operative	0.993	1.022	0.732*
Ever Other occupation	1.034	1.079**	0.989
Log likelihood:	*1714.248*	*1123.098*	*172.059*
Nagelkerke R Square:	*0.057*	*0.084*	*0.169*
Type of Occupation			
No dominant occupation	*ref*	*ref*	*ref*
Mainly manager	1.709	1.364	1.764
Mainly Professional or associate professional	1.823	0.874	0.228
Mainly Clerical	1.271	1.617	0.474
Mainly Craft	1.295	0.890	0.029*
Mainly Personal protective	1.642	1.628	0.905
Mainly Plant operative	0.953	0.666	0.250
Mainly Other occupation	1.418	1.668	
Missing occupational data	0.891	0.645	0.266
Employed less than 25% of working life	0.127***	0.110***	0.174
Log likelihood:	*1174.068*	*796.608*	*113.734*
Nagelkerke R Square:	*0.212*	*0.209*	*0.342*

A5: Work history and working after state pension age – alternative definitions

Table 13: Logistic regression of working beyond state pension age (any one year) by type and duration of employment

Number of years in employment	Without controls	With controls
Employed less than 5 years	*ref*	*Ref*
Employed 5-10 years	1.777	1.775
Employed 10-15 years	5.345***	7.069***
Employed 15-20 years	6.048***	9.202***
Employed 20 to 25 years	6.332***	11.611***
Employed 25 to 30 years	6.248***	12.107***
Employed 30 to 35 years	5.486***	12.494***
Employed 35+ years	4.341***	18.728***
Log likelihood:	*2435.649*	*1711.496*
Nagelkerke R Square:	*0.044*	*0.196*
Type of contract		
Mainly full time	*ref*	*ref*
Mainly part time	2.686***	2.422***
Mixed	2.915***	3.060***
Log likelihood:	*2344.888*	*1720.014*
Nagelkerke R Square:	*0.062*	*0.162*
Never full time employed	*Ref*	*Ref*
Ever employed full time	*0.778*	*0.926*
Never part time employed	*ref*	*ref*
Ever employed part time	*2.768****	*2.978****
Never self employed	*ref*	*ref*
Ever self employed	2.000***	2.656***
Log likelihood:	*2398.544*	*1754.260*
Nagelkerke R Square:	*0.070*	*0.169*
Active for less than 15 years	ref	ref
Short career, mostly part time	4.121***	6.211***
Long career, mostly part time	4.367***	6.475***
Short career, mixed	3.436***	5.590***
Long career, mixed	4.797***	12.517***
Short career, mostly full time	2.010**	3.235***
Long career, mostly full time	1.444*	4.225***
Log likelihood:	*2390.719*	*1712.762*
Nagelkerke R Square:	*0.074*	*0.198*

Table 14 Logistic regression of working beyond state pension age for year by type and duration of inactivity

Number of years inactive	Without controls	With controls
Inactive for less than 6 months	*ref*	*ref*
Inactive for 6 months to 5 years	0.289***	0.241***
Inactive 5 years to 10 years	0.414***	0.230***
Inactive 10-20 years	0.635**	0.255**
Inactive 20-30 years	0.595**	0.180***
Inactive 30+ years	0.127***	0.028***
Log likelihood:	*2385.024*	*1683.095*
Nagelkerke R Square:	*0.078*	*0.232*
Type of Inactivity		
Did not retire early	*ref*	*ref*
Retired Early <2 years	0.78***	0.066***
Retired Early 2-5 years	0.39***	0.039***
Retired Early 5 years or more	0.26***	0.021***
Was not unemployed/ sick	*Ref*	*Ref*
Unemployed or disabled <2 years	0.644*	1.050
2+ years	0.088***	0.145***
No family care	*Ref*	*Ref*
<5 years	1.573*	1.336
5-10 years	1.312	1.043
10-20 years	1.595**	1.062
20+ years	0.430***	0.244***
Never other inactive	*Ref*	*Ref*
< 2 years	0.523**	0.504**
2+ years	0.703	0.778
Log likelihood:	*1928.522*	*1430.665*
Nagelkerke R Square:	*0.323*	*0.380*

Table 15 Logistic regression of working beyond state pension age for year by timing of activity – any one year

Duration and timing of employment	Without controls	With controls
Mostly inactive throughout	*Ref*	*ref*
Active throughout	3.938***	12.508***
Mostly active, retires early	0.714	1.880
Mostly active with mid career break	12.314***	16.983***
Mostly active with early career break	3.821***	10.181***
Extended early	0.928	1.881
Extended interrupted	8.502***	11.729***
Extended late	9.522***	14.767***
Short early	1.448	1.302
Short mid	0.628	0.964
Short late	16.714***	22.298***
Log likelihood:	*2278.917*	*1613.929*
Nagelkerke R Square:	*0.138*	*0.248*

Table 16 Logistic regression of working beyond state pension age for any one year by number and type of main occupation

Number of Occupations	**Without controls**	**With controls**
One occupation	*ref*	*ref*
One change	1.526***	1.788***
Two changes	0.992	1.514*
Recurrent changes	0.727	1.259
Log likelihood:	*2138.434*	*1529.557*
Nagelkerke R Square:	*0.013*	*0.154*
Type of Occupation		
Ever manager	1.165	1.508*
Ever Professional	1.041	1.237
Ever associate professional	0.928	1.026
Ever Clerical	1.053	1.082*
Ever Craft	0.967	1.011
Ever Personal protective	1.058*	1.079**
Ever Sales	1.044	1.047
Ever Plant operative	0.956*	0.987
Ever Other occupation	1.019	1.038*
Log likelihood:	*2484.101*	*1816.330*
Nagelkerke R Square:	*0.019*	*0.124*
Type of Main Occupation		
No dominant occupation	*ref*	*ref*
Mainly manager	1.261	1.836*
Mainly Professional or associate professional	0.706	1.071
Mainly Clerical	0.956	1.154
Mainly Craft	0.481***	0.696
Mainly Personal protective	1.302	1.513
Mainly Plant operative	0.348***	0.544
Mainly Other occupation	1.071	1.377
Missing occupational data	0.884	0.915
Employed less than 25% of working life	0.217***	0.116***
Log likelihood:	*2413.631*	*1715.664*
Nagelkerke R Square:	*0.061*	*0.196*

Table 17 Logistic regression of working beyond state pension age (full year) by type and duration of employment

Number of years in employment	Without controls	With controls
Employed less than 5 years	*ref*	*ref*
Employed 5-10 years	2.813*	2.830
Employed 10-15 years	7.733***	11.385***
Employed 15-20 years	6.808***	12.684***
Employed 20 to 25 years	6.492***	14.567***
Employed 25 to 30 years	6.690***	15.811***
Employed 30 to 35 years	6.107***	18.164***
Employed 35+ years	4.877***	23.696***
Log likelihood:	*2062.187*	*1350.537*
Nagelkerke R Square:	*0.037*	*0.265*
Type of contract		
Mainly full time	*ref*	*ref*
Mainly part time	2.698***	3.062***
Mixed	2.655***	3.694***
Log likelihood:	*2001.751*	*1350.998*
Nagelkerke R Square:	*0.051*	*0.248*
Never full time employed	*Ref*	*Ref*
Ever employed full time	*0.798*	*1.056*
Never part time employed	*ref*	*Ref*
Ever employed part time	*2.618****	*3.528****
Never self employed	*ref*	*Ref*
Ever self employed	1.800***	3.187***
Log likelihood:	*2042.433*	*1372.333*
Nagelkerke R Square:	*0.054*	*0.252*
Active for less than 15 years	*ref*	*ref*
Short career, mostly part time	3.434***	6.768***
Long career, mostly part time	3.565***	7.461***
Short career, mixed	2.454***	5.194***
Long career, mixed	3.556***	13.441***
Short career, mostly full time	1.577*	2.709***
Long career, mostly full time	1.231	3.708***
Log likelihood:	*2046.399*	*1349.369*
Nagelkerke R Square:	*0.052*	*0.269*

Table 18 Logistic regression of working beyond state pension age for full year by type and duration of inactivity

Number of years inactive	Without controls	With controls
Inactive for less than 6 months	*ref*	*ref*
Inactive for 6 months to 5 years	0.257***	0.217***
Inactive 5 years to 10 years	0.439***	0.286***
Inactive 10-15 years	0.602**	0.262***
Inactive 20-30 years	0.645*	0.203***
Inactive 30+ years	0.143***	0.029***
Log likelihood:	*2021.456*	*1315.639*
Nagelkerke R Square:	*0.068*	*0.294*
Type of Inactivity		
Did not retire early	*ref*	*ref*
Retired Early <2 years	0.056***	0.039***
Retired Early 2 years or more	0.007***	0.005***
Was not unemployed/ sick	*Ref*	*ref*
Unemployed or disabled <2 years	0.694	1.484
2+ years	0.092***	0.177**
No family care	*Ref*	*Ref*
<5 years	1.207	1.409
5-10 years	1.339	1.466
10-20 years	1.382	1.073
20+ years	0.465***	0.256***
Never other inactive	*Ref*	*Ref*
< 2 years	0.355***	0.390**
2+ years	0.499	0.562
Log likelihood:	*1615.212*	*1083.140*
Nagelkerke R Square:	*0.316*	*0.454*

Table 19: Logistic regression of working beyond state pension age for a full year by timing of activity

Duration and timing of employment	Without controls	With controls
Mostly inactive throughout	*Ref*	*ref*
Active throughout	3.382***	15.872***
Mostly active, retires early	0.139	0.413
Mostly active with mid career break	12.044***	18.623***
Mostly active with early career break	4.070***	14.281***
Extended early	0.033	1.451
Extended interrupted	10.518***	17.750***
Extended late	8.253**	16.397***
Short early	1.837	1.664
Short mid	0.582	1.076
Short late	17.282***	23.340***
Log likelihood:	*1912.466*	*1264.827*

Nagelkerke R Square:	*0.138*	*0.323*

Table 20: Logistic regression of working beyond state pension age for full year by number and type of main occupation

Number of Occupations	**Without controls**	**With controls**
One occupation	*ref*	*ref*
One change	1.198	1.498*
Two changes	0.924	1.751*
Recurrent changes	0.442*	1.222
Log likelihood:	*1797.104*	*1189.133*
Nagelkerke R Square:	*0.009*	*0.240*
Type of Occupation		
Ever manager	0.881	1.382
Ever Professional	0.906	1.074
Ever associate professional	0.913	1.053
Ever Clerical	1.056	1.146**
Ever Craft	0.923**	0.984
Ever Personal protective	1.046	1.093**
Ever Sales	1.016	1.042
Ever Plant operative	0.976	1.019
Ever Other occupation	1.015	1.042*
Log likelihood:	*2099.266*	*1436.761*
Nagelkerke R Square:	*0.016*	*0.203*
Type of Main Occupation		
No dominant occupation	*Ref*	*ref*
Mainly manager	1.137	1.671
Mainly Professional or associate professional	0.469**	0.679
Mainly Clerical	0.934	1.201
Mainly Craft	0.435***	0.639
Mainly Personal protective	1.033	1.165
Mainly Plant operative	0.404**	0.590
Mainly Other occupation	1.027	1.232
Missing occupational data	0.968	0.807
Employed less than 25% of working life	0.230***	0.101***
Log likelihood:	*2048.528*	*1355.244*
Nagelkerke R Square:	*0.050*	*0.264*